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HOOKER'S

JOURNAL OF BOTANY

AND

KEW GARDEN MISCELLANY.

EDITED BY

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KEW GARDEN MISCELLANY.

Florula Hongkongensis: *an Enumeration of the Plants collected in the Island of Hongkong, by* Major J. G. Champion, 95*th Reg.*; *the determinations revised and the new species described by* George Bentham, Esq.

(*Continued from* vol. v. p. 200.)

Euphorbiaceæ.

1. Euphorbia *pilulifera*, Linn.

A weed, common all over the tropics, with *E. hypericifolia*, Linn., which is also found in Hongkong, though not in Major Champion's collection.

2. Stillingia *sebifera*, Mich.

Common in Hongkong as a shrub, though less so in the arboreous form.

3. Stillingia *discolor*, Champ., sp. n.; foliis longe petiolatis oblongis glabris subtus candicantibus, glandulis ad apicem petioli solitariis geminisve, in pagina inferiore raris v. nullis, spica androgyna densa, bracteis latis, masculis plurifloris, calyce trifido.—*Frutex?* ramulis tenuibus cum foliorum pagina inferiore more *Omalanthi populifolii* glaucescentibus albidisve. *Folia* 2–3 poll. longa, 1–1¼ poll. lata, nunc obtusa, nunc acutiuscule acuminata, divaricato-penninervia. *Petioli* 6–8 lin. longi, graciles. *Glandulæ* 2 haud magnæ ad apicem

petioli in pagina superiore sæpe in unam confluentes, et nonnullæ interdum in pagina inferiore laminæ sparsæ; hæ tamen sæpe omnino desunt. *Spica* fere sessilis, bipollicaris, ei *S. sebiferæ* subsimilis sed densior, et in omnibus speciminibus a me visis androgyna est. *Bracteæ* parvæ, latæ, truncatæ v. medio brevissime acuminatæ et margine plus minus fimbriatæ, glandulis dorsalibus crassis maximam partem bracteæ obtegentibus. *Flores* omnes pedicellati, pedicello 1–1½ lin. longo, bracteis nonnullis parvis acutis basi fulto; fœminei solitarii, calyce trifido lobis acutis, ovario glabro, stylo ad medium trifido, lobis rotundatis obtusis. *Stamina* sæpius 2, rarius solitaria.

Gathered with the preceding. I have it also from Griffith's Malacca collection, so that it has a evidently a wide range, but I cannot find it anywhere published.

4. Stillingia *Japonica*, Sieb. et Zucc. Pl. Jap. Fam. Nat. p. 37.

Common in ravines, *Col. Eyre.*—This differs from Zuccarini's short character, in the leaves being less acuminated, and the glands at the top of the petiole being often solitary or wanting. In both these respects, however, the specimens of the original plant communicated to me by Dr. Blume show considerable variations.

5. Acalypha *Indica*, Linn.

A common weed.

6. Stipellaria *trewioides*, gen. nov. *Alchorneæ* et *Rottleræ* affine.

In ravines, Hongkong.

Char. Gen. Stipellaria. *Flores* dioici, racemosi, apetali. *Masculi* fasciculati, pedicellati. *Calyx* globosus, 2–4-partitus, laciniis æstivatione valvatis membranaceis latis concavis. *Stamina* 8, v. abortu pauciora, filamentis basi in annulum connatis, antheris ovoideis ad apicem filamenti affixis, loculis longitudinaliter dehiscentibus. *Fœminei* solitarii. *Calyx* 5–8-phyllus, sepalis angustis acuminatis. *Ovarium* sessile, globosum, 3–4-loculare, loculis uniovulatis. *Stylus* fere ad basin 3–4-partitus, laciniis subulatis haud plumosis intus papilloso-stigmatosis. *Capsula* subglobosa, leviter sexsulca, tricocca, epicarpio subcarnoso.—*Frutices* vel *arbores* Asiatici. *Folia* longiuscule petiolata, alterna, ampla, acuminata, serrato-dentata, membranacea, 3–5-costata, penninervia et transversim venosa, petiolo basi bistipulato, apice stipellis 2 erectis reflexisve aucto. *Racemi* simplices v. subramosi, masculi ad axillas ramorum annotinorum; fœminei ad apices ramorum hornotinorum basi sæpe foliati. *Flores* pedicellati, masculi

ad axillam bracteæ minimæ fasciculati, bracteolis minutis v. nullis; fœminei solitarii, bractea bracteolisque ad basin pedicelli stipuliformibus.

This genus is certainly allied to the American and West African genus *Alchornea*, but the male inflorescence is different, being rather that of *Trewia* and *Rottlera*, as also the anthers, the female calyx, etc., besides that the ovarium appears to be constantly 3–4-merous, not dimerous as in *Alchornea*, and the stipellæ at the summit of the petiole are very peculiar.

The following are the species which I find in my herbarium:—

(1.) S. *trewioides;* foliis late cordatis subtus præter venas glabris, floribus masculis glabris, pedicello calyce longiore, racemo fœmineo vix puberulo, stylis per anthesin ovario 3–4-plo longioribus.—*Ramuli novelli* pubescentes, mox glabrati. *Stipulæ* parvæ, lanceolato-subulatæ, caducæ. *Folia* 4–6-pollicaria v. majora, basi late cordata, auriculis rotundatis, apice ut in omnibus speciebus cognitis longe acuminata, margine irregulariter calloso-serrata, novella puberula, adulta supra glabra, subtus ad venas hirtella et sæpe rubescentia, basi inter costas glandulas planas gerentia. *Stipellæ* lanceolato-subulatæ, 1–2 lin. longæ. *Racemi masculi* solitarii, simplices, subtripollicares; fasciculi dissiti, 4–8-flori. *Calyx* inapertus globosus, lineam diametro, glaber, laciniis concavis, demum reflexis. *Filamenta* calyce breviora, complanata, basi breviter connata; antheræ ad apicem filamenti eglandulosi insertæ et eo longiores, ovoideæ, erectæ, loculis longitudinaliter dehiscentibus. *Racemi fœminei* masculis longiores et firmiores. *Flores* dissiti, inferiores sæpe ad axillam folii caulinis conformis, cæteri ad axillam bracteæ parvæ lanceolato-subulatæ solitarii, pedicello crasso 1–2 lin. longo. *Calycis* laciniæ 5–6, lanceolato-subulatæ, inæquales ($1\frac{1}{2}$–2 lin. longæ), rigidulæ, persistentes. *Ovarium* globosum, tomentoso-canescens, tetramerum v. rarius trimerum. *Styli* laciniæ semipollicares. *Fructus* immaturus tomento brevi canescens, nec tuberculosus.—Hongkong.

(2.) S. *mollis;* foliis late ovatis basi vix cordatis subtus ramulisque molliter pubescentibus, pedicellis fœmineis brevissimis, stylis ovario vix duplo longioribus.—*Rottlera mollissima*, Wall. Cat. n. 7825.

Differs from *S. trewioides* in the leaves scarcely ever cordate and more regularly serrate, and almost sessile female flowers with styles not half the length; from *S. villosa* in the very short pubescence, the female

calyx much shorter and usually only five-leaved, the short styles, etc. The stipellæ are like those of *S. trewioides*, but usually smaller. The male flowers are unknown.—Nepal, *Wallich*.

(3.) S. *villosa*; foliis ovatis subcordatis subtus molliter villosis, racemis villosis, masculo simplici, pedicellis brevissimis, fœmineo ramoso, floribus distincte pedicellatis, stylis elongatis.—*Folia* ampla, sed proportione angustiora quam in *S. trewioide*, basi sinu parvo subcordata. *Stipellæ* latiores, 1–3 lin. longæ. *Racemi* masculi 2–4-pollicares, calyce parvo bipartito molliter villoso; stamina sæpius 8. *Racemi* fœminei ad apices ramorum plurimi. *Flores* breviter sed distincte pedicellati. *Calycis* laciniæ sæpius 6–8, quam in præcedentibus longiores. *Styli* 10–11 lin. longi, fere ad basin liberi.—Malacca, *Griffith: Cuming*, n. 2307.

(4.) S. *tiliæfolia*; minute puberula v. glabrata, foliis late ovatis remote denticulatis basi cuneatis v. rotundatis, racemis simplicibus, masculorum pedicellis brevissimis, capsulis tuberculatis.—*Folia* 3–4 poll. longa, 2–3 poll. lata, subtus ad venas minute hirtella, cæterum glabra, glandulis baseos minimis v. nullis. *Stipellæ* rigidulæ, 1–1½ lin. longæ. *Racemi masculi* 2–3-pollicares. *Flores* parvi, pedicello calyce sæpius breviore. *Calyx* 4-fidus. *Stamina* sæpius 8. *Racemi fœminei* breves, pedicellis brevissimis. *Flores* ipsos non vidi. *Capsula* fere globosa, 3–4 lin. diametro, leviter sexsulca et undique tuberculis asperata.—Sillet, *Wallich*, n. 7829.

(5.) S. *parviflora*; minute puberula, foliis ovatis v. ovato-oblongis serratis basi obtusis, racemis subramosis, masculis gracilibus, floribus minimis pubescentibus, fœmineis minute puberulis, capsulis tuberculatis.—*Partes novellæ* tomentoso-pubescentes. *Folia* adulta 3–5-pollicaria, supra ad venas puberula, subtus breviter hirtella, basi inter costas glandulifera. *Stipellæ* vix lineam longæ. *Racemi* masculi 2–4-pollicares, simplices v. ramulo uno alterove instructi. *Flores* omnium minimi (vix semilineam diametro), 4-fidi. *Antheræ* 5–6?* *Racemi fœminei* ad apicem rami subramosi, ramis floribusque infimis folio subtensis. *Capsula* (subbaccata?) fere globosa, leviter 6-sulca, verrucis elevatis plus minus corrugata, in specimine 4–5 lin. diametro. *Stylus* 4 lin. longus, usque ad ¾ trifidus.—Philippine Islands, *Cuming*, n. 1800.

* The flowers are however in my specimen so rotten, that I found it impossible to ascertain their structure with certainty.

Wallich's n. 7777 appears to be a sixth species of *Stipellaria*, with narrower leaves than any of the foregoing, but my specimen has neither flowers nor fruit.

7. Rottlera *tinctoria*, Roxb. Fl. Ind. vol. iii. p. 827.

Common in ravines and woods of the Happy Valley. It is a narrow-leaved form, with the spikes usually simple, and is probably the *R. aurantiaca*, Hook. et Arn. Bot. Beech. p. 270. I have the same variety from the Himalaya as well as from the Philippine Islands.

8. Rottlera *paniculata*, A. Juss.

In ravines, subarboreous. The specimens correspond exactly with those from Canton, mentioned in the Botany of Beechey's voyage. Major Champion gathered both sexes.

9. Croton *lachnocarpum*, sp. n.; fruticosum, foliis oblongis acutiusculis subtus ramulisque stellato-pilosis, glandulis stipitatis ad serraturas parvas, racemis masculis androgynisve folio longioribus stellato-tomentosis, floribus 5-petalis 5-glandulosis, superioribus masculis fasciculatis 10–12-andris, inferioribus fœmineis distinctis, horum petalis minutis subulatis, capsula villosa.—*Frutex* v. *arbor*, tomento ramulorum canescente v. subrufescente. *Stipulæ* inconspicuæ. *Folia* alterna, $1\frac{1}{2}$–$2\frac{1}{2}$ poll. longa, 9–11 lin. lata, nunc acuta et mucronata, nunc fere obtusa, margine obtuse serrulata, basi obtusa, viridia, supra demum fere glabra, subtus pilis stellatis densiuscule vestita; glandulæ paginæ inferioris parvæ, stipitatæ, ad quamquam serraturam solitariæ, ad basin laminæ geminæ; petiolus tomentosus, 3–5 lin. longus. *Racemi* subterminales, 3–4-pollicares. *Bracteæ* parvæ, subulatæ. *Flores* masculi per 3–5 fasciculati, pedicellis lineam longis. *Calyx* ante anthesin depresso-globosus, extus villosus, lineam diametro, demum 5-partitus, laciniis ovali-oblongis obtusiusculis. *Petala* 5, oblonga, obtusa, calycem æquantia, margine ciliata. *Glandulæ* breves, ovoideæ, integræ, cum petalis alternantes. *Stamina* 10–12, disco piloso inserta; filamentis calycem superantibus glabris, antherarum loculis distinctis erectis parallelis connectivo apice obsolete glandulifero adnatis. *Flores fœminei* in parte inferiore racemi androgyni pauci, sub quaque bractea solitarii, pedicello quam in maribus breviore et crassiore. *Calyx* 5-partitus, laciniis angustis integerrimis crassiusculis linea paullo longioribus extus villosis, æstivatione valvata. *Petala* minima, subulata, ciliata. *Glandulæ* parvæ, emarginatæ. *Ovarium* hirsutissimum. *Styli* 3, bifidi, lobis subu-

latis glabris. *Capsula* 3 lin. diametro, tricocca, extus glandulis parvis tomento stellato et pilis longis basi ramosis vestita.

Common in woods. The species is certainly in its villous male flowers and in some other respects allied to *C. lacciferum*, but the leaves are very much narrower, not at all cordate, the flowers considerably smaller, the stamens fewer (although I do not find in *C. lacciferum* quite so many as are represented in Wight, Ic. t. 1915); and it is moreover remarkable by the stipitate glands along the margin of the leaves on the underside. As to the genus, it certainly would be included in *Croton*, even under the most limited definition hitherto published by Klotzsch; but that character would also include *C. Tiglium*, which that botanist has more recently separated under the generic name of *Tiglium* (Pl. Meyen. p. 418). I cannot, from the description there given, discover the grounds of the separation, nor form any idea whether he would refer the present species with it to *Tiglium* or leave it in *Croton*.

There are in the collection two other specimens apparently of species belonging to the *Crotoneæ*, but insufficient for determination.

10. Glochidion *molle*, Hook. et Arn. Bot. Beech. p. 210.

Happy Valley woods. The *Bradleia ovata*, Wall. Cat. n. 7852, from Nepal, which I have also from other parts of the Himalaya, appears to be the same species.

11. Glochidion *eriocarpum*, Champ. sp. n.; ramis dense rufo-hirsutis, foliis breviter petiolatis ovato-lanceolatis utrinque hirsutis, pedicellis masculis filiformibus hirsutis, floribus fœmineis sessilibus, stylo brevissimo, fructibus glomeratis depressis molliter villosis.—*Pili* ramorum densi, patentes. *Folia* quam in *G. Sinico* majora, tenuiora, et semper pilis patentibus utrinque hirsuta. *Stipulæ* subulatæ, 1–2 lin. longæ, deciduæ. *Petioli* $\frac{1}{2}$–1 lin. longi. *Flores* fasciculati, *masculi* in axillis inferioribus, fœminei in superioribus; masculorum pedicellus 2–3 lin. longus, hirsutus. *Perigonii* laciniæ sex, biseriatæ, 1 lin. longæ, oblongæ, petaloideæ; exteriores extus hirtellæ. *Antheræ* 3, subsessiles, connectivis crassis loculos superantibus usque ad medium in columnam coalitis. *Flores fœminei* sessiles. *Calyx* hirsutus, 5-partitus, laciniis angustis. *Ovarium* hirsutum. *Stylus* erectus, villosus, 5-fidus, ovario ipso multo brevior. *Capsulæ* (baccatæ?) arcte sessiles, in specimine nondum maturæ, sed jam 4–5 lin. diametro.

Happy Valley woods. The species resembles in some respects the

Bradleia coronata of Wallich, Cat. n. 7857, but that has larger leaves smooth on the upper side, less sessile fruits, and a remarkably long style.

Mr. Hinds gathered another *Glochidion* on the island (*G. macrophyllum*, Benth. in Hook. Lond. Journ. Bot. vol. i.), and the *G. Sinicum* appears to grow on several of the neighbouring islands, but neither of them are in Major Champion's collection.

12. Melanthesa *Chinensis*, Bl. Bijdr.—*M. cernua*, Benth. in Hook. Lond. Journ. Bot. vol. i. p. 491, non Dcne.—*Phyllanthus lucens*, Poir. —Hook. et Arn. Bot. Beech. p. 210.

Woods, Hongkong.

13. Phyllanthus *Maderaspatana*, Linn.?

Hongkong. A small specimen, agreeing precisely with Peninsular specimens, which I cannot but refer to the plant described by Linnæus and Willdenow, although it differs in some respects from that figured by Wight in his Icones, t. 1895, fig. 3. The whole plant is of a glaucous hue; the leaves generally cuneate or narrow-obovate; the pedicels shorter than the fully-developed female calyx. The anthers are three, distinct, and scarcely sessile at the apex of the filaments, erect, but without the projecting connectivum mentioned by Wight. The seeds are beautifully marked with about eight or ten slender longitudinal ribs and innumerable transverse rugosities.

14. Phyllanthus? *cinerascens*, Hook. et Arn. Bot. Beech. p. 211.

Hongkong, gathered also at Lantao by Dr. Cantor. I have not seen the male flower, but the plant must probably be referred to Wight's genus *Macraea*. The females are borne on pedicels about 2 lines long, and when fully expanded are a line and a half in diameter, with six lobes broadly ovate. The *ovary* is encircled at the base by a slightly lobed thick glandular disc, in which it is almost buried at the time of flowering, but from which it soon emerges. *Styles* joined at the base, and each divided to the middle into two recurved lobes. *Capsule* above 2 lines in diameter, depressed, globose; the seeds, under a strong magnifier, marked with innumerable minute tubercles.

The two common Indian weeds, *Phyllanthus Niruri* and *P. Urinaria*, are probably also to be found in Hongkong, as I have seen Chinese specimens of both. The *P. Urinaria*, distinguished by modern authors by its warty capsules (see Bot. Beech. p. 210), has also the seeds marked by deep transverse furrows, which the *Niruri* has not (see Zucc. Pl. Jap.

Fam. Nat. p. 36), but I cannot discover any character to separate from it the *P. Cantoniensis*, Hornem., described by Klotzsch, Pl. Meyen. p. 420, *P. lepidocarpa*, Sieb. et Zucc. Pl. Jap. l. c., of both of which I have examined authentic specimens, nor yet the *P. leprocarpa*, Wight, Ic. t. 1895, f. 4, judging from specimens of Gardner.

15. Emblica *officinalis*, Gærtn. var.—*Dichelactina nodicaulis*, Hance, in Walp. Ann. Bot. vol. iii. p. 376.

Ravines, Hongkong. I have examined several forms of this species, all closely resembling each other in their foliage and pubescent branches. In the common cultivated variety, the male flowers are very small, and crowded on the lower parts of the small branches, from which the leaves are mostly fallen at the time of flowering. These male flowers are mostly without glands, although I have sometimes seen them about the size of those figured in Wight, Ic. t. 1896. In the Himalayan specimens the flowers are generally less crowded, the floral leaves more persistent, the male flowers sometimes without glands, sometimes with one or two only, larger than in the above-quoted figure. In my Hongkong specimen the inflorescence is as in the Himalayan, but the male flowers are rather larger, and all six glands are of a considerable size. I have not seen the female flowers of the latter, but in the East Indian specimens the irregular teeth of the cup-shaped disc, and the divisions of the branches of the styles, are variable in size. The knotty enlargements of the woody stem mentioned by Hance, are to be seen occasionally in Indian specimens.

16. Briedelia *tomentosa*, Bl., var. *glabrescens*.—*B. Loureiri*, Hook. et Arn. Bot. Beech. p. 211?

Hedges, East Point. The specimen is in fruit only, so that I am not certain of its identity with Hooker and Arnott's species. It only differs from those distributed by Wallich from Penang and by Zollinger from Java, as the *B. tomentosa*, Bl. in the smoothness of the leaves; they are never however wholly without a few small hairs on the underside, especially towards the base of the midrib. I have both the pubescent and smooth forms from Assam and Sillet.

17. Goughia *Nilgherrensis*, Wight, Ic. t. 1877 et 1878.

Woods, towards Little Hongkong, where it is abundant and forms a tree. The specimens, both male and female, are precisely similar to those I have from Gardner from the Neilgherries; and widely separated as are these stations, I cannot find the slightest character to distinguish

them. The stamina in both vary from six to eight or even nine. Another male specimen, from a shrub on the summit of Mount Gough, has the calyx rather more developed, the filaments dilated, and the anther-cells half buried in a fleshy connectivum, owing apparently to an accidental deformity.

The genus *Goughia* has long been lying in our herbaria under the manuscript name of *Gyrandra*, Lindl., under which a species is also entered in Wallich's Catalogue; but having never been published, the name is now pre-occupied by a Gentianeous genus of Grisebach's. This species, as well as another from the Himalayas, appears to be distinct from Wight's, and the two may be thus characterized:—

G. Himalensis, Benth.; foliis ex oblongo-lanceolatis plerisque acutis basi in petiolum racemis breviorem angustatis, calyce obsoleto, floribus masculis 9–12-andris, baccis oblongis.—Kamaon, *R. Blinkworth*, *Wall. Cat. n.* 9048; Mandal Valley, Himalaya, *Edgeworth*; Nainee Tal, *Thomson*, *Strachey*, and *Winterbottom*; Sikkim, alt. 8–10,000 feet, *J. D. Hooker*; Khasya, alt. 5–6000 feet, *Hooker* and *Thomson*.—Leaves 5–10 inches long, and scarcely 2 inches wide. Petiole seldom more than an inch. In the *G. Nilgherrensis* they are seldom more than 3 inches long, more or less obovate-oblong, and rounded at the apex with a small point, and the female calyx is irregular and more persistent.

G. laurina, Benth.; foliis longe petiolatis oblongo-ellipticis obtusis v. rarius acutiusculis, calyce 4–5-dentato dimidio ovarii v. filamenta staminum superante in fœmineis persistente, floribus masculis 6–8-andris, bacca ovoidea.—*Gyrandra laurina*, Wall. Cat. n. 80. Singapore, *Wallich*; Malacca, *Griffith*; Sumatra, *Herb. Hooker.* Leaves 6–12 inches long, 2½–3 broad, obtuse or acute at the base, with the petiole from 1½–4 inches long. Racemes generally shorter than the petioles. Fruit smaller than in *G. Himalensis*.

I have also a small specimen in fruit from Junghuhn's Javanese collection, but insufficient to characterize.

Dr. Hooker, who has kindly supplied me with some notes on these plants, from the Hookerian herbarium and from his personal observations, says the *Goughiæ* are all large shrubs or small evergreen trees, with chambered pith and without milky juice. The anthers are purple.

(*To be continued.*)

Kew Garden Museum; *or, a Notice of the Origin and some of the Contents of the* Museum of Economic Botany *attached to the* Royal Gardens of Kew; *by* the Director, Sir W. J. Hooker, K.H., F.R.A. and L.S.

(*Continued from* vol. v. p. 389.)

Ord. Papaveraceæ. Poppy Family.

The *Papaveraceæ* possess narcotic and acrid properties in an eminent degree. The juice is often white, yellowish in *Chelidonium majus*, red in *Sanguinaria Canadensis*. One species alone (the Opium Poppy) may, in its legitimate use, be reckoned amongst the greatest blessings to mankind,—"magnum Dei donum," as an eminent physician has termed it; while, by its misuse, it has proved the greatest curse: of such importance to the Materia Medica, that, in the last edition of Dr. Pereira's 'Elements of Materia Medica and Therapeutics,' no less than seventy-four large and closely-printed pages are devoted to this one subject. To that, and to the 'Confessions of an Opium Eater,' and other works bearing upon the effects of this plant on the human constitution, we may safely refer our readers: our present business is mainly with the contents of our Museum, as bearing on this Natural Order. The seeds in this family are oily, and generally not narcotic.

White, or *Opium Poppy*. Papaver somniferum, *L.* Considered to be an aboriginal of Asia and Egypt, but cultivated in many warm and temperate climates. Through Dr. Hooker's mission to India a most valuable collection of objects connected with the manufacture of Opium as prepared at Patna, is presented by Dr. Corbett of that establishment to the Museum; so bulky however, that it cannot be placed in its proper arrangement with the rest of the *Papaveraceæ*, but has a large and deep case (54) at the east end of the great Room (No. 3) on the ground-floor, devoted to it.

Taken in detail, this series may be said to commence with a number of small drawings, framed in one, exhibiting the mode, cultivation, etc., of the Opium, viz.:—

1. Represents the ploughing of the field for the cultivation of the Opium Poppy.
2. Breaking the clods after ploughing.
3. Levelling the field after the breaking of the clods.
4. Irrigating or watering the field before it is divided into compartments.

5. Laying out the fields into compartments, or small squares, preparatory to sowing.

6. Sowing the seed.

7. Weeding the plants.

8. Watering the plants.

9. Gathering the "leaves" (or petals) from the flowers, for "caking."

10. Preparing the "leaves" (petals) from the flowers, in a plate, on a gentle fire.

11. Puncturing the Poppy "pods" (heads, or green capsules) with the Nushtur (called Mikurnee at Patna), or lancet.

12. Gathering Opium from the green capsules with the Seetooahs, which flows after the incisions.

13. Placing fresh-gathered Opium in a sloping shallow vessel, to allow the moisture to be drawn off.

14. Conveying Opium to the sub-deputy agent, for weighing.

After the reference to the drawings and the implements above mentioned, our readers will be the better able to understand the following Report on "The System of cultivating the Opium Poppy, and preparing of Opium, in the BENARES OPIUM AGENCY, by W. C. B. EATWELL, M.D., extracted from the Selection of Records of the Bengal Government."

"The cultivation of the Poppy," says Dr. Eatwell, "in British India is confined to the large central Gangetic tract, about 600 miles in length and 200 miles in depth, which is bounded on the north by Goruckpore, on the south by Hazareebaugh, on the east by Dinagepore, and on the west by Agra.

"This large extent of country is divided into two agencies, the *Behar* and the *Benares*, the former being presided over by an agent stationed at Patna, at which station is the central or Sudder factory of the agency, the latter being under the control of an agent residing at Ghazeepore, which station contains the Sudder factory of the Benares agency. Finally, the control of the entire department is vested in the Board of Customs, Salt, and Opium, located in Calcutta. Of the two agencies, the Behar is the larger and more important, sending to the market about treble the quantity of drug turned out by the Benares agency.

"The Benares agency comprises eight divisions, and the aggregate amount of land under Poppy cultivation in the season 1849–50 was

107,823 beegahs*. Each division is under the management of a sub-deputy Opium agent, who resides at a central factory, at which the yearly produce of his division is collected, and whence it is forwarded to the Sudder factory at Ghazeepore; and again, each division is separated into a certain number of subdivisions, called *kotee illaquas*, each being of such extent that a single responsible officer can exert an efficient control over all the operations conducted in it, and each of these kotee illaquas is under the immediate management of a *gomashta*. The *gomashta* has his head-quarters at the kotee, which is a building having some centrical situation, and in it he has his treasury, under the custody of a *tehsildar*, or treasurer, and an establishment sufficient to enable him duly to keep and render the accounts of his illaqua to the sub-deputy agent.

"The number of native officials employed in the Benares agency is very considerable. Of native officers of the first class the number amounts to nearly 150, whilst of subordinate officials and paid servants in constant employ the number reaches very nearly to 1200. In addition to this permanent establishment, there is during the manufacturing season a temporary establishment of upwards of 600 individuals employed in the Ghazeepore sudder factory alone, including three or four European assistants and some twelve or fifteen European and Christian boys. The number of persons actually employed in cultivating the Poppy in the agency is very great. The number of lumberdars, who signed agreements to cultivate in 1849–50, amounted to 21,549, and the total number of under-cultivators was 106,147. When it is further taken into consideration that the families of these individuals take no inconsiderable share in the labours of the cultivation and in the preparation of the drug, some idea may be formed of the vast number of human beings whose interests and welfare are bound up in the Benares agency alone.

"It is a strict rule in the agency that it shall be entirely optional with every person either to enter into agreement to cultivate the Poppy at such prices as may be fixed for the produce by the Government, or to decline the cultivation altogether. The agreement to cultivate is made by the sub-deputy agent, with a lumberdar,—an individual who has a variable number of cultivators under him, and for whom he acts as accredited agent.

* A beegah is 27,225 square feet.

"The lands selected for Poppy cultivation are generally situated in the vicinity of villages, where the facilities for manuring and irrigation are greatest; and from the commencement of the rains in June or July, until October, the ground is dressed and cleaned by successive ploughing and weedings, and manured to the extent which the means of the cultivator will permit. In the final preparation of the land in October and November, the soil, after being well loosened and turned up by the plough, is crushed and broken down by the passage of a heavy log of wood over its surface, and it is in this state ready for sowing. The amount of produce from various lands differs considerably. Under very favourable circumstances of soil and season, as much as twelve or even thirteen seers (26 lbs.) of standard Opium may be obtained from each beegah of 27,225 square feet; under less favourable conditions the out-turn may not exceed three or four seers; but the usual amount of produce varies from six to eight seers per beegah.

"The Poppy cultivated in the Benares and Behar agencies is exclusively the white variety (*Papaver somniferum*, *album*). In situations favourable to its growth it vegetates luxuriantly, attaining usually a height of about four feet. The stem is branched, and is terminated by from two to five ovate-globose capsules, averaging in size a duck's egg. The plant takes about three months and a half in reaching maturity, and the time for its cultivation is exclusively the cold season, extending from November to March.

"The soil having been prepared, the sowing is effected by throwing the seed broad-cast over the land, between the 1st and 15th of November. In three or four days the plough is again passed over the land, to bury the seed; and the soil is afterwards again levelled, by means of the log of wood before alluded to. The whole surface is then divided into square compartments, the sides of which are about ten feet in length, and are raised and converted into little channels for the purpose of irrigation. The number of times the plant may require irrigation depends, in a great measure, upon the nature of the season.

"Ten or twelve days are sufficient for the germination of the seed, and after the little plants have attained a height of two or three inches, they are carefully weeded and thinned.

"In February the plant is generally in full flower, and towards the middle of the month, and just before the time for the fall of the petals, these latter are all carefully stripped off and collected. They are then

formed into circular cakes from ten to fourteen inches in diameter, and about one-sixteenth of an inch in thickness.

"The manner in which these leaf-cakes are formed is the following:—A circular shallow earthen vessel is heated to the requisite degree, by being placed inverted over a slow fire. A few petals are then spread upon its heated convex surface, and as soon as the glutinous juice which they contain is seen to exude, others are added to the moist surface, and are pressed down by means of a cloth. As soon as these latter become moist in turn, they receive a similar addition of petals, and in this manner the cake is extended circularly by successive and continuous additions, until it has reached the required dimensions. Instead of the earthen vessel, a shallow or nearly flat iron cooking utensil is sometimes used.

"The cakes of petals (known in the department under the name of 'leaves'), when they reach the sudder factory at Ghazeepore, are carefully sorted and separated into three classes according to their size and colour. The smaller and dark-coloured 'leaves' are used in forming the inner portions of the shells of the Opium cakes, whilst the largest and least discoloured ones are kept for furnishing their outside coverings. In a few days after the removal of the petals the capsules have reached their utmost state of development, when the process of collection commences, which extends from about the 20th of February to the 25th of March. At about three or four o'clock in the afternoon individuals repair to the fields and scarify the Poppy capsules with sharp iron instruments, called *nushturs*.

"The *nushtur* consists of four narrow bars of iron, each of which is about six inches in length, and of about the thickness of the blade of a penknife. At one extremity, each bar does not exceed a quarter of an inch in breadth; but it gradually expands, until it has acquired the breadth of about one inch at the opposite end, where it is deeply notched. The sides of the notch are somewhat curved and ground to sharp edges, and the external angles are brought to sharp points. The four little bars, being placed side by side, are bound firmly together by means of strong cotton thread; and the points, at their cutting extremities, are kept separated from each other, to the extent of about one-sixteenth of an inch, by means of the cotton thread which is passed between each pair of contiguous blades. Thus prepared, the instrument presents four pair of curved, pointed, diverging blades, somewhat

similar in shape to the lancet-blades of a cupping scarificator. In employing the nushtur, only one set of points is brought into use at a time, and the capsule is scarified longitudinally from its base to its summit, the incisions generally passing more or less along one of the longitudinal eminences observable on the outside of the capsule, which mark the attachment of the internal dissepiments. The scarifications thus made are very superficial, and do no more than traverse the thin pericarp of the capsule.

"If a horizontal section be made of the capsule of a vegetating Poppy-plant, the milky juice will after a few seconds be perceived to exude first, and in greatest quantity, from those portions of the sarcocarp which correspond to the bases of the dissepiments. It does not however exude only from these points, but ultimately from the entire surface of the cut sarcocarp. It moreover does not appear in dots, as if poured out from longitudinal vessels, but exudes gradually from the meshes of the cellular tissue. If a thin segment of the capsule be examined under a high magnifying power, no longitudinal vessels are observable, but a confused mass of cellular tissue is observed occupying the interspace between the epicarp and endocarp; and opposite to the duplicatures of the endocarp, which go to form the dissepiments, the meshes of the cellular tissue are perceived to be much larger than in other situations, hence the free exudation of juice at these points. It therefore appears that the mode of making the scarifications as actually practised is the most effectual that could be adopted. Each capsule is scarified from two to six times, according to its dimensions, an interval of either two or three days being allowed after each operation.

"The capsules having been scarified in the manner above described, the collection of the juice is made at an early hour in the following morning. This is effected by means of instruments called *seetooahs*, which are made of sheet-iron, and resemble concave trowels; and with these the juice is scraped from the surface of the scarifications, until the instruments become filled, when their contents are emptied into an earthen pot, which the collector carries by his side.

"After the plant has ceased to yield any more juice, its utility is still unexhausted. The capsules are then collected, and from the seeds an oil is extracted, which is used by the natives for domestic purposes, both for burning in lamps, and for certain culinary purposes. Of the entire seed a comfit is made, resembling in appearance caraway comfits.

Of the dry cake remaining after the extraction of the oil, a coarse description of unleavened bread is sometimes prepared by the very indigent, or it is given to cattle, or used medicinally for poultices.

"The capsules, deprived of their seeds, are still available for preparing emollient and anodyne decoctions, which the natives use both internally in coughs, and externally as fomentations. The stems and leaves are left standing until they have become perfectly dry, under the influence of the hot winds of April and May, when they are removed, and crushed and broken up into a coarse powder, known in the department under the name of 'Poppy trash,' and which is employed in packing the Opium cakes. The juice, when brought home by the cultivator, is placed in a shallow earthen vessel, which is tilted to such a degree that all the *pussewah* can drain off, and this plan is persevered in so long as anything fluid will separate. The pussewah obtained by this means is set aside in a covered vessel, and receives no further attention until taken for weighment to the Ghazeepore sudder factory.

"The Opium now requires frequent attendance on the part of the cultivator. It is daily exposed to the air, though never to the sun, and is regularly turned over every few days, in order to ensure a uniform dryage in the whole mass; and this process is persevered in for the space of three weeks or a month, or, in fact, until such time as the drug may have reached within a few degrees of standard consistence. Standard Opium, according to the Benares regulations, is Opium which, on being subjected to a temperature of 200° Fahr. until everything volatile is driven off, shall leave a residue of 70 per cent.

"The Opium, on its arrival at the Ghazeepore factory, is turned out of the confined earthen pots in which it is received, and is weighed in wide tin vessels called *tagars*, care being taken that no larger quantity than 10 seers (20 lbs.) is ever brought to the scale at a time. This weighment is made under the eye of the gomashta (or of his accredited agent) of the kotee to which the Opium belongs; and in the case of the neighbouring or 'home' kotees, the cultivators attend in person with their produce.

"The native Opium examiner, or *purkhea*, now plunges his hand into the centre and to the bottom of the drug, stirs it about, and grasps it in various directions to feel for impurities, and then withdraws a handful, which he manipulates between his fingers, revealing its colour, texture, and mode of fracture, and finally ascertains its aroma. He then

throws upon a plate a small portion as a specimen, and estimates its consistence. This estimate is written down on a ticket by the European officer, and it is sent with the specimen to the laboratory, where a fixed weight of drug is accurately weighed, evaporated to dryness in a plate placed on a metallic table heated by steam, and the weight of the residue carefully determined. It rarely happens that the guess of the purkhea (native Opium examiner) differs from the actual assay by more than one or two grains, and it serves to check the actual assay in cases of evident mistake or accident, which occasionally must occur when a multitude of delicate operations are rapidly carried on. The number of specimens which leave the examiner's table daily, amounts to little short of two thousand.

"The *tactus eruditus* possessed by the purkhea is very remarkable: he rarely fails to detect even small quantities of the grosser and more tangible impurities, whilst he is no less delicately alive to the slightest variations in colour and smell. In the event of a specimen appearing to be adulterated, it is at once set aside, to be carefully examined by the opium examiner, who makes a special report respecting it for the information of the agent, who, should he see sufficient grounds for doing so, confiscates it, when the whole of the drug is destroyed, and the cultivator gets nothing for it. Should the adulterations be less extensive, and the drug such as to be not altogether useless, it is taken at half price, or is subjected to such smaller penalty as the examining officer may think fit to inflict; and it is employed in making the *lewah*, or paste, used in forming the shells of the opium-cakes. The great probability of detection, and the risk of confiscation, act as very efficient checks to the prevalence of adulteration, and the quantity of opium confiscated yearly is comparatively small. The nature of the adulterations practised by the cultivators is very various.

"The grosser impurities usually mixed with the drug to increase its weight are mud, sand, powdered charcoal, soot, cow-dung, pounded poppy petals, and pounded seeds of various descriptions. All of these substances are readily discoverable in breaking up the drug in cold water, removing the soluble and lighter portions of the diffused mass by decantation, and carefully examining the sediment. By this means impurities of the above nature usually become physically apparent. Flour is a very favourite article of adulteration, but is readily detected; opium so adulterated speedily becomes sour; it breaks with a peculiar

short, ragged fracture, the sharp edges of which are dull, and not pink and translucent, as they should be, and, on squeezing a mass of the drug after immersion in water, the starch may be seen oozing from its surface; the application of the iodine test however furnishes conclusive evidence of its presence, or at least of that of some amylaceous compound. The farina of the boiled potato is not unfrequently made use of; ghee, and goor (an impure treacle) are also occasionally used, as being articles at the command of most of the cultivators: their presence is revealed by the peculiar odour and consistence which they impart to the drug. In addition to the above, a variety of vegetable juices, extracts, pulps, and colouring matters, are occasionally fraudulently mixed with the opium; such are the inspissated juice of the common prickly pear (*Cactus Dillenii*), the extracts prepared from the tobacco-plant (*Nicotiana Tabacum*), the *Datura Stramonium*, and the Indian hemp (*Cannabis Indica*), etc. The gummy exudations from various plants are frequently used; and of pulps, the most frequently employed are those of the tamarind, and of the bale fruit (*Ægle Marmelos*). To impart colour to the drug, various substances are employed, as catechu, turmeric, the pounded flowers of the mowha-tree (*Bassia latifolia*), etc.

"The colour of well-prepared Opium is a deep dull brown when viewed in mass, which becomes a bright chestnut-brown when a small portion of drug is spread in a thin layer upon a white surface. It adheres to the fingers, and draws out to a moderate extent, breaking with a ragged fracture; should it however contain much pussewah, its ductility is much increased, and it is more glutinous.

"Its smell is peculiar, and perfectly *sui generis;* it is not unpleasant, and in the recent well-prepared drug somewhat fruity.

"After having been duly weighed into store, the Opium receives but little treatment in the factory. It is kept in large wooden boxes, capable of containing about 14 maunds (10 cwt.) each, in which it is (if below the manufacturing standard) occasionally stirred up from the bottom, until it has acquired the necessary consistence. Whilst remaining in these boxes it speedily becomes covered with a thin blackish crust (ulmine), and deepens in colour according to the amount of exposure to air and light which it undergoes. Should the drug be of very low consistence, it is placed in shallow wooden drawers, instead of in boxes, in which it is constantly turned over, until its consistence has approxi-

mated to 70 per cent. From the general store, or *malkhana*, the drug is exported daily in quantities equalling about 250 maunds, for the purpose of being manufactured or made up into balls, or '*cakes*,' as they are termed in the department.

"In exporting Opium for this purpose, the officer who performs the duty selects for the most part Opium which is exactly at standard, or very close to it; whilst to compensate for any drug which may have risen higher than the prescribed consistence, a certain proportion of Opium of low consistence is exported, the consistences of the various proportions of drug selected for export being determined by a certain number of test assays. The portions of drug thus selected are then weighed out with exactitude, in portions of 10 seers (20 lbs.) each, and are thrown promiscuously into shallow wooden drawers, in which men mix them up together, rapidly and thoroughly thrusting their arms into the drug and kneading it in various directions. From these drawers the Opium is transferred as mixed to boxes, all of which are of the same size, and from each of which a specimen is drawn and assayed. The mean of the assays of these boxes gives the average consistence of the export of the day, and serves as a guide as to whether the drug be of the proper consistence for caking. The above operations are generally completed by about 4 P.M., and before evening the drug is removed from the boxes to large wooden vats, 20 feet long, $3\frac{1}{2}$ feet wide, and $1\frac{1}{4}$ feet deep, situated in the caking-room. In these vats it undergoes a further kneading and admixture, by men who wade knee-deep through the Opium, from one end of the vats to the other, until their contents appear to be of uniform consistence. Two specimens are, on the following morning, drawn from each vat, and assayed; and should the consistence have reached the factory standard, caking immediately commences.

"Down either side of the room in which the vats are placed, are ranged the cake-makers, numbering usually about one hundred and ten individuals. Each man being seated upon a wooden stand, and being furnished with a brass cup, forming the half of a hollow sphere, and with another tin vessel graduated so as to hold a determinate quantity of fluid. On the previous evening the leaves requisite for forming the shells of the cakes have been weighed out and tied up in bundles of prescribed weight, and have been damped to render them supple. Down the centre of the room are placed a certain number of small

scales, at which the quantity of Opium intended for each cake is separately weighed; and beside the scales are boxes filled with lewah, for the agglutination of the leaves which form the shells of the cakes. In forming the lewah, all Opium of inferior quality is used, and all the pussewah received is also employed for this purpose; but in addition to these, a considerable quantity of unexceptionable drug is also expended. These are broken down in the washings of the various pots and vessels which have contained Opium, and a thin semi-fluid paste is formed, of such a consistence that 100 grains of it, when evaporated to dryness at a temperature of 200° Fahr., shall leave 53 grains of residue.

"Matters being thus arranged, the cake-maker receives in his graduated measure from the lewah box, the prescribed quantity of lewah for making a single cake; and having by his side a bundle of leaves previously weighed, he rapidly forms in his brass cup the lower segment of the shell of the Opium cake, pasting leaf over leaf, until the thickness of half an inch has been obtained, and allowing a certain free portion of the most external leaves to hang down all round over the sides of the brass cup. This accomplished, a boy is in waiting with the Opium to be put into the cake, which he has just brought from the caking scales, and which he throws into the shell so far prepared to receive it. The cake-maker, holding the Opium away from the sides of the shell with the left hand, then tucks in round the sides leaf after leaf, well smeared with lewah, imbricating one over the other, until he has completed the entire circle; the free edges of the leaves, which had hitherto hung over the sides of the cup, are now drawn up tightly, and the Opium well compressed within its bag of leaves.

"A small portion at the top now only remains, which is speedily closed by laying on leaf after leaf, and finally the work is completed, by the application of a single large leaf, which covers the entire exposed half of the cake. As thus formed, the well-finished cake is a pretty regular sphere, not unlike, in size and appearance, a 24 lb. shot. It is now rolled in a little finely-pounded poppy trash, which adheres to its surface, is at once placed in a small earthen cup, of precisely the same dimensions as the brass mould in which it was made, and is carried out into the open air, and exposed to the direct influence of the sun. It is so exposed for three days, during which time it is frequently turned, and examined, and if (as is frequently the case) it should have become distended and puffy, it is at once torn open, the extricated gas allowed

to escape, and the cake again tightly closed. On the evening of the third day it is placed (still contained in its cup) in the cake frames, which are formed of open battens, and allow of a free circulation of air about the cakes. The average number of cakes made by a single man, in one day, is about 70; but there are cake-makers who will turn out as many as 90 or 100 cakes, between 9 A.M. and 3 P.M. The number of cakes made daily in the factory, during the manufacturing season, is from 6500 to 7000, and the total number of cakes manufactured, during the present season, has been 426,800.

"By the end of July the manufacturing is finished, but the cakes still require much attention; they are constantly turned over in their cups, and, as mildew collects on their surfaces, it is removed by rolling and rubbing them in dry poppy trash. They are moreover individually examined, and those which present weak points are strengthened by the application of extra leaves; and their appearance is moreover improved by the application of a single leaf of the first quality, which, being of large dimensions, and carefully and equally made, covers the greater portion of the surface of the cake, and gives to it a smooth and finished appearance.

"By October the cakes have become perfectly dry to the touch, and have acquired considerable solidity; and they are now packed in chests, each of which is furnished with a double tier of wooden partitions, each tier presenting twenty square compartments, for the reception of so many cakes, and in which the cakes are steadied by means of loose poppy trash, with which all the interstices are filled.

"It might be supposed that so fragile a structure as the poppy petal would furnish but an insecure packing envelope; but the shells of the Opium cakes are possessed of more resistance than might be imagined, and, owing apparently to some antiseptic property in the lewah, they are capable (after once being thoroughly dried) of being preserved for a great length of time. For three or four months after manufacture, the shells require constant care and attention; and even after being packed, any exposure to damp or moisture subjects them to injury. After a certain lapse of time however, the Opium contained in the cake ceases to yield any more moisture to the shell, and this latter acquires extreme solidity. There are three specimen cakes in the Ghazeepore factory, some fifteen years old; they are as solid as balls of wood, and may be thrown from a height upon a stone floor without injury.

"The above process of manufacture applies to the Opium which is put up for the China market, and which includes the great bulk of the entire provision. With the drug intended for internal consumption, and called Abkaree Opium, a different process is followed. The Opium intended for abkaree purposes is brought to a consistence of 90 per cent. by direct exposure to the sun, in which state it is as firm and as easily moulded as wax. It is then formed, by means of a mould, into square bricks of one seer weight each, and these are wrapped in oiled Nepaul paper, and packed in boxes, furnished with compartments for their reception. The Opium put up in this way has not the same powerful aroma as is possessed by that put up in balls; but this is its only deficiency, whilst it has the great advantage of containing a large amount of drug, in a very limited space, and in a state very manageable for packing.

"The manufacture for the season being finally concluded, six cakes are selected promiscuously, from the provision by the magistrate of Ghazeepore, for examination and chemical analysis. Of these, two are forwarded to the Opium examiner at Calcutta, two to the examiner of the Behar agency, and two are reserved for examination by the examiner of the Benares agency.

"A chief chemical feature which distinguishes Bengal Opium from that of Turkey and Egypt, is the large proportion which the narcotine in the former bears to the morphia; and this proportion is shown by analysis to be constant in all seasons. It is a matter of importance to ascertain, whether the treatment which the juice receives after its collection, can influence in any way the amount of the alkaloids, or of the other principles contained in Opium. In Turkey, it is the custom to beat up the juice with saliva; in Malwa it is immersed, as collected, in linseed oil, whilst in Bengal it is brought to the required consistence by mere exposure to the air in the shade, though at the same time all the watery part of the juice that will separate is drained off, and used, as has already been explained, in making lewah.

"The following are the results which Dr. Eatwell obtained from the analysis of fresh juice, collected in February, 1850, and from which none of the pussewah was separated. The analysis has special reference to the amount of the alkaloids, morphia and narcotine, present in the drug; no attempts having been made to separate any of the other principles in a state of purity.

"Analysis of 2000 grains of freshly-collected juice, subjected to experiment on the day of collection :—

	Grains.
Morphia	11·1
Narcotine	32·7
Other matters soluble in alcohol, codeia, narceia, meconic acid, resin, etc. etc.	521·0
Dry marc insoluble in alcohol, lignin, caoutchouc, etc. etc.	225·2
Water and volatile matter separable at a heat of 200° Fahr.	1210·0
Total	2000·0

"It has already been stated that, in preparing the drug, the cultivators drain from it all the fluid portion, which of course consists of the most soluble of the principles of Opium, dissolved in dew, or in moisture absorbed from the atmosphere. This fluid, to which the name of *pussewah* is given, is brought to the factory in large quantities, of many gallons at a time, and of all consistences, from that of a limpid fluid to that of thick treacle.

"Recently collected pussewah is a dark fluid, resembling strong infusion of coffee, and having a peculiar smell.

"The quantity of standard Opium received at the sudder factory of the Benares agency, during the season of 1849–50, was 18,191 maunds, whilst the quantity of pussewah delivered amounted to 100 maunds, being at the rate of one maund of pussewah to nearly 182 maunds of drug; the pussewah containing on an average, say 50 per cent. of solid matter. This pussewah, be it observed, although separated from the drug, is not lost to the provision, being employed in the formation of the shells of the cakes; and, as the Chinese form a watery extract of the drug for the purpose of smoking, the whole of the constituents of the pussewah are thus recovered on boiling the shells in water, as is practised in China.

"Amongst the thousands of individuals, cultivators, and employés with whom the factory is filled during the receiving and manufacturing seasons, no complaints are ever heard of any injurious effects resulting from the influence of the drug, whilst they all remain quite as free from general sickness as persons unconnected with the general establishment,—in fact, if anything, more so. It occasionally happens that a casual visitor to the factory complains of giddiness or headache, but

the European officers employed in the department, who pass the greater part of the day with the thermometer between 95° and 105° Fahr. amongst tons of the drug, never experience any bad effects from it. The native purkhea sits usually from six A.M. to three P.M. daily, with his hand and arm immersed nearly the whole time in the drug, which he is constantly smelling, and yet he feels no inconvenience from it. He has informed me that at the commencement of the season he experiences usually a sensation of numbness in the fingers; but I believe this to be more the result of fatigue, consequent upon the incessant use of the arm and fingers, than of any effect of the Opium. In the large caking vats, men are employed to wade knee-deep through the drug for several hours during the morning, and they remain standing in it during the greater part of the rest of the day, serving out the Opium by *armfuls*, their bodies being naked, with the exception of a cloth about the loins.

"These men complain of a sensation of drowsiness towards the end of their daily labours, and declare that they are overpowered early in the evening by sleep, but they do not complain of the effect as being either unpleasant or injurious.

"Infants, a few months old, may be frequently seen lying on the opium-besmeared floor under the vats, in which dangerous position they are left by their thoughtless mothers; but, strange to say, without any accident ever occurring. Here are abundant facts to show, that the health of those employed in the opium factory and in the manipulation of the drug, is not exposed to any risk whatever, whilst the impunity with which the drug is handled, by hundreds of individuals for hours together, proves that it has no endermic action."

We must now give a list of the articles presented to our Museum by Mr. Oldfield, of the Behar Opium Agency, Patna, employed there in the preparation of this drug; and the same are, we believe, employed at Benares.

1. Poppy leaves, as used for wrapping the drug; sufficient for one cake.
2. Five *Mahurnees*, or instruments for patching.
3. Some *Puttle*, or leaves (not *Puttee*, which is used for filling up the interstices of the chest compartment: *vide* No. 25), used for pasting and repairing the cakes.
4. One empty jar, in which the Opium is brought to the Godowns.

5. A round tin tagar, or pan, used for holding samples, with its cover.

6. A small specimen of Opium adulterated by water, in a bottle.

7. Opium adulterated by pussewah, in a bottle.

8. A rake for mixing the Opium in the vat, for making it of one uniform quality.

9. A brass cup, used in caking.

10. Earthen cups, in which the balls are dried.

11. A chest, with its compartments, as ready for filling.

12. A ball of Opium as ready for the China market, equal in value to 1 seer 10 chittacks of Opium, at 75° consistence factory weight, and $5\frac{1}{2}$ chittacks of lewah or paste at 51° consistence, and $5\frac{1}{2}$ chittacks of Poppy leaves, or puttle.

13. A cake of Opium as prepared for the Medical Board.

14. A shell, half-made.

15. Some patched Poppy pods.

16. Some unpatched Poppy pods.

17. Two sittooas, or scoops, for collecting the Poppy juice from the pods.

18. Earthen kurraces.

19. A brass lewah cup. This cup contains lewah sufficient for one cake.

20. A kareegur, or cake-maker's seat.

21. A tray, in which Poppy leaves are served out to the cake-makers.

22. A tray, in which Opium balls are made by the cake-makers.

23. A stool for keeping tagars.

24. A tin tagar, for holding Opium sufficient for five cakes.

25. Some Poppy trash, used in filling up the interstices of the compartments in the chest.

26. Bamboo scoop, for taking out Opium from jars for examination.

27. A brass thallee, or edged plate, in which the fresh Opium is collected by the Poppy cultivators.

We must now return from the collection in the great Room No. 3, case 54, to the continuation of this collection in Room No. 1, and the case marked PAPAVERACEÆ; and we shall find, in further connection with Opium (*Papaver somniferum*),—

Poppy-heads, varying in form and size, from different localities.

(From these also, in a dried state, the decoction, syrup, and extract of Poppies are prepared.)

Extract of Poppy-heads, from Mr. Kent.

Poppy-heads, cultivated in England, having been attacked by tom-tits (*Parus cæruleus*) for the purpose of getting out the seeds, and making almost a skeleton of the capsules (Rev. Professor Henslow).

Seeds of Papaver somniferum. These, as has been already observed of the family, are not narcotic, but yield a bland oil, "similar to that obtained from Olives." We possess the *white*-seeded and the *blue*- and *black*-seeded varieties. In Mr. Lawson's collection it is called *Maw-seed.* Samples of the *oil* are here, and also in the "Camphine" collection (Room No. 3, case 53).

Besides the Brazil (or Patna) Opium above alluded to in Room No. 3, we possess,—

Turkey Opium and *Egyptian Opium*, both from Messrs. J. Bell and Co. *Persian Opium*, from Trebizond (Dr. Pereira); and *English Opium*, prepared and presented by T. Morson, Esq.

Poppy petals. Under this name are seen the petals of the *Common Corn Poppy* (Papaver Rhæas, *L.*). Europe. These are employed in the preparation of the "Syropus Rhæados," or Syrup of Corn Poppies; but chiefly used as mere colouring matter.

Argemone Mexicana, L. Tropical and warm countries generally. Fruit and seeds; Jamaica, Dr. M'Fadyen. Infusion occasionally used medicinally. Opinions vary as to the nature of the seeds. Barham says the fruit is called by the Spaniards in the West Indies, "Figo del Inferno," because of the powerful narcotic effect; Dr. M'Fadyen refutes this. Mr. Higgins says that in Nevis the oil is used as a substitute for Castor-oil.

Blood-root. Sanguinaria Canadensis, *L.* United States and Canada. Root and extract (United Society). An acrid narcotic.

Celandine. Chelidonium majus, *L.* Europe. Extract (J. H. Kent, Esq., and the United Society, and Lawson's collection). An acrid poison; yet used medicinally. The yellow juice is said to remove warts.

(*To be continued.*)

Cyperaceæ Cumingianæ (Insularum Philippinensium) *Herbarii Lindleyani*; auctore Neesio ab Esenbeck. 1849.

(*Communicated by* Dr. Lindley.)

Cuming. 2437. Cyperus (Pycreus) *lamprocarpus*, N. ab E.; umbella composita radiis (3–4) inæqualibus erectis, spiculis (7–9) capitatim fasciculatis linearibus 20–24-floris, squamis ovatis apice connivente-acutis dorso sanguinolentis subtilissime 5-nervibus margine infimisque totis membranaceo-pallidis, stylo bifido basi rigidula diutius persistente, stigmatibus deciduis, caryopsi obovata mucronulata lævi nitida atra squama $\frac{1}{3}$ breviore, involucri 2–3-phylli foliis duobus umbella longioribus, foliis anguste linearibus apice valde attenuatis læviusculis glaucis culmum trigonum æquantibus.—Similis quod ad characteres *C. sanguinolento* majori cuidam, differt autem jam sola caryopsi atra nitida majoreque, quæ ista plus duplo minor, squama sua cinereo-fusca et opaca.

Cuming. 546. Cyperus compressus, *N. ab E. in Wight, Contrib.*—Forma hæc C. pectinatum, *Roxb.*, exhibet.

„ 676. „ pusillus, *Vahl, En.*—β, spiculis capitatis.—C. angustifolius, *N. ab E. in Wight, Contrib.*

„ 557. „ hexastachyus, β** castaneus, *N. ab E. in Wight, Contrib.*

„ 444. „ distans, *Linn.*

„ 1636. „ canescens, *Vahl.*

„ 536. Diclidium elatum, *a*, *N. ab E.* Papyrus elatus, *N. ab E. in Wight, Contrib.*

„ 2464. Cyperus.—Nimis est tener et incompletus ut possit dignosci. Probabiliter autem est *C.* (*Papyri*) *corymbosi* status junior.

„ 538. } „ dilutus, *Vahl.* Mariscus dilutus, *N. ab E. in*
„ 1656. } *Wight, Contrib.*

„ 537. „ *racemosus*, Retz, var. spiculis infuscatis: an species distincta? (*C. obscurus*, N. ab E.); umbella decomposita fastigiata multiradiata patula, radiis compresso-trigonis striatis, universalibus partialibusque apice umbellatis e spicis pluribus sessilibus linearibus strictis, spiculis imbricatis lanceolatis compressis subebracteolatis 10–14-floris, squamis arcte imbricatis ovato-orbiculatis ex apice rotundato-mucronatis mucrone erecto-patulo, dorso olivaceo-fuscis, 5-nervibus latere sordide luteis, stylo trifido, caryopsi ovali alba biconvexa mucro-

nata, involucro 7–8-phyllo umbella longiore, foliolis margine scaberrimis, involucellis foliaceis umbellula brevioribus, foliis . . ., culmo triquetro firmo lævi.—A *C. racemoso*, Retz, differt umbella magis patula spiculisque paulo latioribus obscuris, squamis obtuse neque argute carinatis rigidioribus latere incurvis explanatis subrotundis et obtusissimis cum mucrone.—A *C. verticillato*, Roxb., recedit, spicis umbellularibus haud æqualibus angustioribus, radiis umbellaribus tribus 3–5-stachyis immixtis, unde umbella decomposita et supradecomposita.

Cuming. 535. Cyperus marginellus, *N. ab E.*, var. spiculis pallidioribus.
„ 563. „ Iria, *Linn.*, var. *a.*
„ 549. „ difformis, *Linn.*
„ 559. „ nitens, *Retz* (pulvinatus, *N. ab E. in Wight Contrib.*)
„ 445. } „ diffusus, *Vahl*, *a*, longifolius.
„ 533. }
„ 534. „ longifolius, *Poir.* (*diffusi* var.)
„ 568. Mariscus cyperinus, *Vahl.*
„ 2372. „ *irroratus*, N. ab E.; culmo trigono, capitulo brevi conico denso e tribus capitulis confluente, spiculis erectis oblongis bifloris, squamulis involucralibus binis latis obtusis scariosis, squamis fertilibus æqualibus ovalibus obtusiusculis 11–13-nervibus, nervis tenuibus crenulatis interstitiis fusco-punctatis, involucro 3–4-phyllo foliis tribus capitulo longioribus, culmo basi bulboso ad medium folioso foliis angustis culmum subæquantibus.—Soli *M. colorato* conjunctior est.

Cuming. 2417. Cyperus leucocephalus, *Retz.* Squamæ spiculæ a latere fere lineares, truncato-obtusæ, utrinque uninerves, albæ aut lutescentes. Caryopsis lineari-oblonga, rufo-brunnea. Est ex affinitate *C. Luzulæ*, quo et spectat *C. Siletensis.*
„ 1558. Kyllingia gracilis, *Kth.*, var. capitulo globoso.
„ 552. „ brevifolia, fol. latioribus.
„ 1418. Lipocarpha lævigata, *a*, *N. ab E.*
„ 1254. Fuirena pentagona, *N. et A.*
„ 670. Eriocaulon? Plantula singularis, at nimis deflorata.
„ 558. Fimbristylis brizoides, var. Δ. Royleana. F. Royleana, *N. ab E. in Wight, Contrib.*

Cuming. 396. Fimbristylis rigidula, *N. ab E.*
„ 1413. „ bispicata, var. monostachya.
„ 530. Trichelostylis complanata. Caryopsis in hac acute tuberculata.
„ 564. „ miliacea, *N. ab E.*
„ 1508. Oncostylis barbata, *a* 2, *N. ab E.*—*Isolepis barbata,* N. ab E. in Wight, Contrib.
„ 675. Fimbristylis acuminata, var. *pumila;* culmo capillari, caryopsi duplo minore.
„ 1255. Limnochloa plantaginea tenuior, articulis magis approximatis, ad tumidam accedens.
„ 932. Baumea *falcata,* N. ab E.; panicula densa nuda vaginis foliaceo-cuspidatis interstincta, spicis capitato-conglomeratis, spiculis subcapitatis imbricatis 4-floris, squamis patentibus, caryopsi ovato-subglobosa obsolete trigona rostro sericeo, foliis ensiformibus culmo brevioribus.—Caryopsis basi attenuata. Stamina 3.

Cuming. 1773. Calyptrostylis articulata, *N. ab E.*
„ 807. Remirea *Wightiana,* N. ab E.; *β*, pedunculo folia æquante. An species distincta?—Caryopsis videtur (immatura) compressa, stylus est bifidus, altero ramo sæpe bifido.—Quod articulum summæ racheos caryopsin recipientem appellat Kunth, certo est squama superior durior facta.

Cuming. 1764. Carex *cirrhulosa,* N. ab E.; spicis compositis basive decompositis inferioribus exserte pedunculatis, rachi compresso-triquetra angulis aculeato-scabris, spiculis apice masculis inferne demum denudatis, fructu ovali trigono gibboso nervoso longirostri patente angulis apicem versus scabris, squamis e basi brevissima membranacea ovata cuspidatis cuspide capillari longissima patente recurvave, bracteis omnibus foliaceis foliisque latiuscule linearibus margine scabris culmo triquetro longioribus.—Squamis spiculæ apice capillaribus spiculam æquantibus distinctissima species, quibus cum fructu delapsis squamæ masculæ tanquam coma in rachillæ apice resident.

Cuming. 1795. Carex *oligostachya,* N. ab E.; spiculis androgynis solitariis ovalibus sessilibus superne masculis binis ternisve in pedunculis lateralibus geminis longis inæqualibus, terminalibus pluribus, racheos angulis asperis, stigmatibus ternis, fructu depresso-trigono ovato rostrato nervoso margine superne scabro squamam oblongam ex apice obtuso subulato-mucronatam 7-nervem margine ciliato-scabram æquante,

foliis lineari-angustis apicem versus margine scabris, inferioribus culmum, floralibus pedunculos æquantibus.—Quod ad fructum similis *C. Lindleyanæ*, differt pedunculis paucifloris, squamis angustioribus pallide fuscis opacis. Culmus $\frac{1}{2}$–$\frac{3}{4}$ ped. altus.

BOTANICAL INFORMATION.

Welwitsch's Portuguese Plants.

Mr. Pamplin has on sale, in Frith-street, several sets of Welwitsch's *Cryptogamic Plants* of Portugal; viz. of *Fungi, Lichens, Seaweeds, Mosses,* and *Hepaticæ.* The price of each (or all) is 30*s.* per 100 species. They are exceedingly well prepared, and many of them correctly named, especially the *Fungi* by Mr. Berkeley.—One complete set alone remains on sale of the *Phænogamous* plants, containing nearly 1200 species, the price of which is 25*s.* the 100 species.

Australian Eucalypti.

We learn, from an article inserted in the 'Gardeners' Chronicle' (1853, p. 614), on the authority of Mr. John Walters, Botanic Gardens, Melbourne, that Mr. Swainson, the well-known zoologist, is engaged on a monograph of the genus *Eucalyptus*, for which purpose he had visited South Australia, and, in May last, had been for three months residing on the Dandynoy range of hills, Melbourne, "in which place alone he had discovered some hundreds of species." "The sum of £800 has been set apart by Government, to cover the expenses of this undertaking." We wish the Home Government would exhibit as much liberality in the patronage of botany.—Mr. Swainson is well able to depict the protean forms of these "Gum-trees;" but we trust he will not mistake varieties for species.

Ralph's Plants of New Zealand.

Mr. Pamplin has lately received a few sets of Mr. Ralph's New

Zealand Plants, chiefly collected about Wellington. The number at present sent is rather under 100 species, which are offered for sale. Price at the rate of 35*s*. the hundred. More may be expected soon.

NOTICES OF BOOKS.

Illustrations of ORCHIDACEOUS PLANTS: *comprising figures of the most interesting and beautiful Genera, partly selected from the* 'Botanical Register' *and* 'British Flower Garden;' *popular descriptions of all the cultivated Species, after the nomenclature of* Dr. Lindley's 'Folia Orchidacea,' *and directions for their Cultivation; edited by* THOMAS MOORE, F.L.S. London: Willis. Large 8vo. Plates, coloured or uncoloured.

Of this work the 2nd number is now before us, containing six plates of *Odontoglossa*. The intention of it is, as expressed in the advertisement, "to place within easy access of those who take an interest in their study and cultivation, a series of accurate figures, which shall delineate, in some measure, the endless variety of structure and appearance in these grotesque-flowered plants, and at the same time portray with accuracy the most popular kinds. This the publisher is enabled to do in consequence of his having become possessed of the original plates, from which the numerous fine figures of these plants, published in the later volumes of the 'Botanical Register,' under the immediate superintendence of Dr. Lindley, were obtained." To these it is proposed to make such additions as will render the volumes illustrative of all the genera worthy of cultivation. The plan of publication is here similar to that determined on by Dr. Lindley in his 'Folia Orchidacea,' viz. that of completing one genus or more in each part, except in the few cases in which the larger genera will require to be divided into portions of convenient length. It is announced, too, that the genera will be published nearly in the order in which they occur in the 'Folia Orchidacea:' so that the book may be considered as exhibiting illustrations of that important publication.

Mr. Moore, we are sure, will conduct the editorial part in a creditable manner. The Number before us is devoted to the following species

of the genus *Odontoglossum;* viz.—1. *O. maculatum.* 2. *O. mystacinum.* 3. *O. Rossii.* 4. *O. Cervantesii.* 5. *O. membranaceum* (now considered a variety of the latter). 6. *O. Bictonensis.* Three more species will appear in the following number: and here are characters given in English of twenty-three species.

It is a pity, as the plates are not placed to face the letter-press, that the name of the species, as well as the genus, is not given on the plates.

HOOKER, DR. JOSEPH DALTON: *The Botany of the Antarctic Voyage.* II. New Zealand. *Second Portion of the Flowering Plants.* Published by Authority of the Lords Commissioners of the Admiralty. 4to. 20 plates, coloured or plain. London: Lovell Reeve. 1853.

The second portion of the second section of the 'Botany of the Antarctic Voyage' has recently appeared, viz. of the 'Flora of New Zealand,' and is chiefly occupied by Monocotyledonous plants, of which the plates and descriptions are executed with the accustomed fidelity of the author. Nearly forty pages are however devoted to "A Summary of the History of the Botany of New Zealand," and an Essay on the limits of species, their dispersion, and variation.

SIR W. J. HOOKER'S *Icones Plantarum.*

The last (or tenth) volume of this long-continued work (altogether including 1000 plates) has been undertaken by Mr. Pamplin, and it is expected will be ready to be issued during the month of January. It is entirely devoted to new, rare, or little-known *Ferns;* and it is Mr. Pamplin's intention to strike off separate copies of this, with the title of 'A Century of New or Rare Ferns.'

Accompanying this tenth volume of the 'Icones,' will be given a complete Index of all the species, alphabetically arranged, in which such corrections and alterations will be made in the nomenclature as may be deemed necessary by the Author.

Journal of a Voyage up the AMAZON *and* RIO NEGRO; *by* RICHARD SPRUCE, ESQ.

(*Continued from* vol. v. p. 215.)

San Carlos del Rio Negro (Venezuela), June 27, 1853.

I received, some time ago, your very interesting letter of January 27, 1852, and I should have replied to it earlier, but that I have waited to complete and pack up a small collection I have made for your museum. One cannot count here, as in England, on a commission being executed in a given time; and some fine hammocks, ornamented at the borders with feathers, which I ordered in February 1852, have only very lately been completed, and I have had to go as far as Tomo to fetch them: I have selected the most showy of them for your Museum, and I hope it will please you. These hammocks are made in the house of a Portuguese emigrant, Senhor Antonio José Diaz, to whom is due the credit of the design and grouping of the ornaments; but the work is executed entirely by Indian girls. Senhor Diaz has obtained great repute for his hammocks, which in the Barra fetch 80 milreis a piece, and in Pará as much as 100 milreis.

I hope you received the last case I sent you from S. Gabriel, containing principally articles worn by the Indians on the Rio Uaupés in their feasts. As I have now spent several months among these Indians, I have seen the whole of these articles in use, and I have two corrections to make to the account I gave you of them. The *Murucú*, or spear, *is* really used in war, and the white stone is worn by *all* the men, and not merely by the chiefs (as I had been wrongly informed). Those of "royal" descent alone, are allowed to wear a stone bored lengthwise instead of across.

The remaining articles I am now sending, are also from the Uaupés. I met there with several other things, which I should have liked to transmit to you, had they not been too bulky. Even among those actually sent, are some of inconvenient bulk; especially four "devils," which, innocent as they may look, have been the cause of not a few scourgings and poisonings in their native country. I had no small difficulty in carrying them off: they had to be wrapped in cloths and mats, so as completely to disguise their form, and to be put on board by night, covering them up so in the canoe as never to appear during the voyage. I could not send these and the other matters from the Uaupés direct, for want of boards to make a box to deposit them in.

Perhaps the most interesting article I am now forwarding, is a quantity of salt (weighing thirty pounds, when put up) made from various species of *Podostemeæ*, growing on the cataracts of the Uaupés: it was obtained with considerable difficulty, at several times and of several different Indians.

There is also a glass jar of *Ipadú* (Coca), from which a chemical analysis can be made, as well as of the *Podostemon* salt, whose constituents I am anxious to ascertain.

I had another glass jar containing *Caapí*, an intoxicating drink used by the Uaupé Indians in their festas; but after I had kept it five months, and thought it quite safe, the Caapí fermented and burst the jar. I can therefore send only the articles from which it is prepared, viz. portions of the stems of a twining *Malpighiacea* (seemingly an undescribed *Banisteria*), and of the roots of an Apocyneous twiner (*Hæmadictyon*). The extraordinary effects produced on the Indians by drinking Caapí I have myself witnessed, and I have detailed them to Mr. Bentham in some notes on the plants collected.

I could not send entire the large drum used on the Uaupés, as it is a portion of the trunk of a Lauraceous tree, and of itself nearly a load for a canoe; but I enclose a rough sketch of it, accompanied by the drumsticks, which are of caoutchouc.

I had a very interesting excursion on the Uaupés, lasting from the end of August (if I include the voyage from S. Gabriel) to early in March of the present year. My collection contains a greater number than any preceding one of the tallest forest-trees, among which are several undescribed *Vochysiaceæ* and *Cæsalpiniæ*. There are also a great many new things among the minutest tribes of flowering-plants, such as *Podostemeæ*, *Triurideæ*, *Burmanniaceæ*, and the leafless *Gentianeæ* (*Voyriæ*). I suppose that, of the whole collection, numbering some 500 species, about four-fifths are entirely undescribed. I unfortunately made myself ill, by working too hard both in and out of doors in the heat of the day, and was visited by some distressing attacks of vertigo, from which I am yet scarcely free.

The mechanical labour of drying plants is so great here, that I have little time for making geographical and other observations; and as Mr. Wallace has preceded me on the Uaupés, and his occupations leave him much more spare time than mine do, I scarcely attended to anything but botany there. I determined the latitude of Panuré, or São Jeronymo,

an Indian village at the foot of the first falls, which I made my principal station, to be 0° 13′ N. My watch has proved almost useless in determining longitudes, and I much regret I did not bring with me a telescope. I purchased indeed a telescope in the Barra of a Franciscan friar, who had bought it at Rio Janeiro; and it has proved of the greatest service to me in my herborizations, enabling me to distinguish green flowers on a tree at the distance of a mile, and, when sailing near the bank of a river, to ascertain the form of the leaves of the adjacent trees; but it barely shows the satellites of Jupiter, and is not sufficiently powerful to take an observation of them with accuracy.

I intended at this time to have transmitted to Sir F. Beaufort my barometrical register, and a few scattered geographical observations; but have not time to copy them out. He did not state, along with the aneroid he kindly sent me, whether or not it corresponded exactly with the mercurial barometer when it was put up. When I opened it out at the Barra do Rio Negro, in September 1851, the zero point was considerably higher than it ought to be (as much as four-tenths of an inch), and it seems to have gone on gradually rising ever since. The instrument however may be depended on for horary differences, and for low altitudes. I mark every day the maximum and minimum; and it is interesting to observe with what regularity the atmospheric tides recur on the equator, being apparently totally uninfluenced by changes in the weather. During the space of nearly two years, it has only twice occurred that the minimum has been considerably retarded beyond its usual hour, which is from three to four o'clock, while the maximum is attained between nine and ten.

Ever since I have been on the Rio Negro, I have made inquiries respecting the position and possible means of reaching the sources of the Orinoco, without any expectation however, on my part, of being able to solve this interesting geographical problem. Quite unexpectedly the means of doing it seem about to be placed within my reach. We were lately visited at San Carlos by the Commisario Geral of the Canton of the Rio Negro, Don Gregorio Diaz, who resides at San Fernando de Atabapo; and on my mentioning to him how much I should like to reach the head-waters of the Orinoco, he at once entered ardently into the project, saying that it was what he had all his life been longing to do, and that if I would promise to accompany him, he would arrange as many men well-armed as he could, to start on the expedition early in

the year 1854. Nearly all the whites in the canton seem eager to join us, being possessed with the idea that there is certainly an El Dorado at the source of the Orinoco. Don Gregorio is at present making a progress through his dominions, having come to San Carlos by the Atabapo and Guainia, and returning by the Casiquiare and Orinoco. He proposes to ascend above Esmeralda as far as the mouth of the Manáca, and to enter three days' journey within this river, where there is a pueblo, established a few years ago. He engages to make everywhere inquiries as to the best route for reaching the sources of the Orinoco, and the facilities or hindrances we may expect to encounter. I heard from him the other day, from about midway along the Casiquiare; and he promises to write to me again, should there be opportunity, from Esmeralda.

As to the modes of reaching the sources of the Orinoco, besides that of following the river itself, there appear to be several. When I was at the Barra, the most direct route seemed to be by the Rio Padanirí, whose mouth is a little eastward of the 64th meridian. This large river has its sources in the Serra de *Tapiíra-pecú*, or "Ox's-tongue," and the Orinoco is considered to rise on the north-eastern slopes of the same serra. Persons who have ascended high up the Padanirí, in quest of salsaparilha, assure me they have met Indians from the sources of the Orinoco. The river Padanirí, however, gives dysentery and the ague to every one who enters it; and it was here my countryman, Mr. Bradley, caught the illness which proved fatal to him, while cutting piassaba with a party of Indians. The Maraniá is the next large river entering the Rio Negro on the same side, but its course is ascertained to be much shorter than that of the Padanirí. The Rio Canaborís, which enters the Rio Negro on the 66th meridian, probably extends nearly to the Orinoco; in its lower part it makes a large curve to the westward, nearly parallel to that of the Rio Negro; and I have been assured by Indians at S. Gabriel, that it ran not much to the eastward of that place. From Marabitanas, the frontier town of Brazil, I could distinctly see, though at a great distance, the serrania called *Pirá-pukú*, or "The Long Fish," whose base is laved by the Canaborís. The lofty ridge seems to run westward, trending slightly northward; and the portion of it seen from Marabitanas extends through an angle of about 90° (from east nearly to north), its prolongation westward being hidden from view by the forest on the opposite side of the river. With my

telescope I could discern steep escarpments bare of forest; but in no part could I distinguish the trees, the forest-clad portion being only recognizable from its colour. I suppose that the highest part—an abrupt truncate peak about midway—may be nearly 4000 feet above the plain. Those who have ascended the river Canaborís, describe it as very picturesque, and possessing a peculiar vegetation. Certain curious plants, said to resemble both Palms and Ferns, from the description given me, can only be *Cycades*. I was delighted to meet with a *Cycas* on the Uaupés, though it never showed signs of flowering; it is the only species of this tribe I have seen in South America.

The Rio Canaborís is easily reached from San Carlos, by proceeding up the Paciméni, a tributary of the Casiquiare, and up its southern branch, the Baría, from which there is a short portage to the Canaborís; but nothing of bulk could be taken this way, and I have reason to believe that the Canaborís does not reach the Cerro de Tapiíra-pecú.

A more likely route for us is by the Siápa, the longest tributary of the Casiquiare, called in its upper part the Rio Castanha, and certainly having its sources in the above-named cerro. The only objection to it is, that several steep randales have to be passed; but these may be avoided by making a circuit through the upper mouth of the Casiquiare, and going up the Manáca, from which there is a short passage by land to the Castanha.

We have discussed these and other routes, principally with the view of avoiding the hostile Guaharibos; the more especially as it is believed that these Indians do not extend to the actual sources of the Orinoco, but that tribes inhabit these with whom friendly communication has been held by the Castanha and Padanirí. On the whole, I think we incline to first risk a battle with the Guaharibos; and I have little doubt that, with fifty men well-armed, we should be able to force our way.

Shortly after the separation of Venezuela from the mother-country, and whilst there was still an armed police in the Canton del Rio Negro—there is none of any kind now—the Commandante of San Fernando was sent, with a considerable body of armed men, to endeavour to open amicable relations with the Guaharibos. He reached the Randal de los Guaharibos with his little fleet of fifteen piragoas, and, as the river was full, the whole of them might have passed the randal; but it was not considered necessary, and his own piragoa alone was dragged up, the

rest being left below to await their return. A very little way above, they encountered a large encampment of Guaharibos, by whom they were received amicably; in return for which they rose on the Indians by night, killed as many of the men as they could, and carried off the children. One of these captives is still living near the upper mouth of the Casiquiare, where I hope to see and converse with him. Treatment such as this of course is calculated to confirm, and perhaps it was the original cause of, the hostility of these Indians to the whites. The same sort of thing seems to have been practised anciently among the head-waters of all these rivers. On the Rio Negro, where the Portuguese had formerly large "fazendas reaes," in which were cultivated great quantities of coffee, indigo, etc., it was the custom to recruit from time to time the hands required for working them, by sending armed men up the various rivers debouching into the Rio Negro and Japurá, to make "pegas" (*razzias*) among the indigenous inhabitants. The "fazendas reaes" have disappeared, and the Brazilian Government has promulgated edicts against the seizing of the native inhabitants and reducing them to slavery; yet the practice still exists, and is connived at. I speak of this with certainty, because since I came up the Rio Negro two such expeditions have been sent up a tributary of the Uaupés, called the Rio Páapurís, to make "pegas" among the Carapaná Indians; and in the second of these, which was sent from Panuré early in the present year, I was in some sort an accomplice, though unwittingly, having lent a gun to one of the Indians engaged in it, not knowing for what purpose it was intended. I have also seen and conversed with two female children stolen from the Carapanás in these expeditions.

The Rio Páapurís enters the Uaupés from the south, at the third cataract (called *Jaguaraté*, or the Tiger) of the latter, about four days above Panuré. It is a beautiful river, being in its lower part a succession of cataracts. I spent a day in it, and would have liked to ascend high on it; but I was informed that the Carapanás were everywhere on the alert, and that the paths leading to their maloccas were stuck with stripes of Paxiuba Palm (*Iriartea exorrhiza*, Mart.), which, besides being as hard as nails, and capable of themselves to inflict a serious wound, were in many cases tipped with Uirarí poison.

To return to the Orinoco. I have met at San Carlos several people who have been as far as the Randal de los Guaharibos. The most intelligent of these, and the person who perhaps of all others knows

most of the country between the Casiquiare and the sources of the Orinoco, is an old gentleman called Don Diego Pina, residing now at Solano (a little within the Casiquiare), but when Schomburgk passed this way, residing at San Carlos, and acting as Commissario. He is unfortunately quite blind, and cannot therefore point out anything on my maps; but his memory seems perfect for distances and bearings. According to him, it takes a month to reach the Randal from Esmeralda, travelling as traders are accustomed to do here,—that is, stopping at the Caños, within which all the Indians usually fix their habitations. The Orinoco above the Randal is still a large river, which in the force of the rainy season might be navigated by piragoas* of considerable size. He is of opinion that the real sources of the Orinoco are very much to the eastward of what is supposed by Humboldt in his 'Aspects of Nature;' and it seems to be clearly made out, that they are at least considerably to the east of the sources of the Rio Branco; or, in other words, that the system of the Rio Branco *overlaps* (if I may so say) that of the Orinoco; a circumstance not without parallel in other river-systems.

Don Diego is perhaps the only white now living in the Canton del Rio Negro who recollects Humboldt in Venezuela. He was making turtle-oil on the Orinoco, on a playa near the mouth of the Apure, when that distinguished traveller passed on his way towards the cataracts. A person died in San Fernando two or three years ago, who had seen Humboldt and Bonpland at Esmeralda, and remembered the difficulty they had in procuring the flowers of the *Juvia* (*Bertholletia excelsa*), for which (said he) they offered an ounce of gold. At the season of fruit of this tree, the Guaharibos descend much below the randal, in order to collect it for food; and at that time the Indians of the Casiquiare, in parties of not more than five or six, lie in wait for them and carry off such as they can lay hold on, making of them slaves for cultivating their cunucos. Many Indians on the Casiquiare can show lance-wounds received from the Guaharibos in these expeditions.

I should mention that Don Gregorio Diaz has also travelled much on the rivers eastward of the Casiquiare, and in his voyages about the head-waters of the Siapa must have very nearly approached the sources of the Orinoco.

* The *piragoa* of Venezuela is the same as the *igaraté* of Brazil, and has for its foundation a hollowed tree-trunk, above which are fastened three or more planks on each side.

I have been twice to the junction of the Guainia and Casiquiare. The water of the latter is not very white, which is explained by its having received, during its course from the Orinoco, two considerable rivers of black water, the Pacimoni and Siapa. The Guainia and Casiquiare seem of nearly equal bulk; but neither can compare with the Uaupés. It should be noted that the name "Guainia" does not extend below the mouth of the Casiquiare, the junction of the two constituting the Rio Negro. "Quiare" is the ancient name of the Rio Negro*, and "Casi-quiare" has evidently some connection with it, but what I am not prepared to say. *Possibly* the prefix "Casi" is pure Spanish (*Lat.* quasi); for the Rio Negro is here considered the continuation of the Casiquiare ("as it were the Quiare"), and not of the Guainia.

I am now preparing a boat to ascend the Casiquiare, and, if possible, explore the mountains at the back of the Duida of Esmeralda, for which purpose the preferable course seems to be to enter the Rio Cunucunúma, whose mouth is half-a-day's journey on the Orinoco, below the Casiquiare. The summit of the Duida is said to be inaccessible, on account of the perpendicular walls of rock on every side of it; yet everybody seems to know perfectly well that there is a round lake on the very top, inhabited by a large turtle, the 'genius' of the mountain. Whether I shall proceed direct from the Cunucunúma towards the sources of the Orinoco, or first return to San Carlos, will depend on the intelligence I receive from Don Gregorio on his reaching San Fernando.

The gratification I naturally feel at finding myself fairly *in terrâ Humboldtianâ* is considerably lessened by various untoward circumstances, not the least of which is the very great difficulty experienced here in procuring the necessaries of life,—so great indeed, that it occupies nearly all a person's time, especially when the river is filling, and we think ourselves well off at San Carlos when we can eat once a day. Anciently, when there were missions in most of the pueblos on the Orinoco and Rio Negro, travellers had in them a ready resource; but for some twenty years past there has not been a padre resident in the Canton del Rio Negro, and scarcely one on the Orinoco out of Angostura. A country without priests, lawyers, doctors, police, and soldiers, is not quite so happy as Rousseau dreamt it ought to be; and this, in which I now am, has been in a state of gradual decadence ever since the separation from Spain, at which period (or shortly after) the inhabitants

* See Baena, 'Ensaio Corografico sobre a Provincia do Pará,' p. 530.

rid themselves of these functionaries in the most unscrupulous manner. San Carlos seems to have fallen off much since Humboldt visited it. Even since Schomburgk, the pueblo has been devastated by a fire, which consumed the church and twenty-two dwelling-houses, of which very few have been rebuilt; and there are now standing, in all, but twenty-six houses. The oldest building in the place is the convent; but no traces remain of the friars who once tenanted it, save in the fair skins of many of the Indians, amongst whom to be a "hijo de padre" is the same as to be born to good luck. There is great need of some force to overawe the Indians, who are far more numerous than the whites, and know their strength. It is not improbable that one of these days they may get up a revolution of their own, as their brethren of Pará did in 1835, when atrocities of every sort may be expected to be committed. On the day I reached San Carlos, the whole Indian population was in a state of intoxication, and I saw them enter without ceremony the houses of the whites, to ask for *burréche* (rum), which they were quite ready to take by force had it been refused. But I have seen worse than this since; and we are now scarcely passed over the feast of San Juan, when the Indians had openly avowed their intention of murdering at least all the foreigners in the place; on which account we have been obliged to watch for some days and nights with arms constantly by our sides.

I notice what you say about the interest the *Victoria* continues to excite in your Gardens. I have observed no *Victoria* since I ascended the Rio Negro, for white water seems essential to its existence. I have most frequently seen it in lakes into which the water of the Amazon entered only in the rainy season; but in June 1851 I noticed two or three plants of it in the Amazon itself, at two days' journey above the Barra. They were growing in a small bay, where the water swept gently round; but at twenty yards from them there was a rapid current. I have been unfortunate with my specimens of this fine plant, those I gathered on my voyage from Santarem having been nearly all wasted by the bad weather, and want of convenience for drying them; but I hope to get more as I descend, and I shall also have my eyes open for it when I reach the Orinoco.

I have now traced the use of *Caraipé*, or the bark of the Pottery-tree, on all the tributaries of the Amazon, as also on the Casiquiare, Upper Orinoco, and Guaviare. Nearly all the species of *Licania* afford it, but

no other genus, so far as I know. The best Caraipé is afforded by species growing in rich, dryish soil; those of the low sandy forests, and of the gapó, containing only a small proportion of silex in the bark. The Indians test Caraipé by burning it; and if, when burnt, it cannot be broken by the fingers, but requires the use of a mortar, it is considered good. In the best sorts, the silex can be seen by the naked eye, filling up the vessels of the bark. On the Uaupés and Guainia, utensils of immense size, such as stills and coppers, are made of clay mixed with Caraipé.

(*To be continued.*)

Report of a JOURNEY OF DISCOVERY *into the Interior of* WESTERN AUSTRALIA, *between 8th September*, 1848, *and 3rd February*, 1849; *by* J. S. ROE, ESQ., Surveyor-General.

Our Botanical Journal, under whatever title it has appeared, has included a great deal of valuable information relating to Australia and the first geographical discoveries in various parts of that colony. In the 'Botanical Miscellany,' volume 1, published in 1830, at p. 221 *et seq.*, we were privileged to publish the Report of Mr. Charles Fraser, the Colonial Botanist in New South Wales, who had been sent to investigate, some years previously, the nature and capabilities of *Swan River* for a settlement in Western Australia. The result of his exploration was summed up by that naturalist and traveller in the following words:—"The advantages, above those of New South Wales, which this country holds out to settlers, besides the important circumstance of its vicinity to India, the Spice Islands, Java, Mauritius, and the Cape of Good Hope, and independent of its situation as a place of call for East India and China ships, are—in the first place, the great ease with which a settler can bring his land into cultivation; secondly, the facility with which he can convey his produce to market, either by land or water, the coast being of easy access on any part near the river, and no impediments existing in the interior; thirdly, the great abundance of fresh water, of the best quality,—an advantage which New South Wales, east of the Blue Mountains, does not possess, excepting on the immediate banks of the rivers and creeks; fourthly, the prevalence of limestone." When this country soon after came to be settled, the most gloomy forebodings, with respect to its future prosperity, owing,

no doubt, to bad management, were widely circulated. But time has proved the accuracy of Mr. Fraser's views, and we now hear no complaints, but, on the contrary, the most gratifying intelligence of its prosperity. In a botanical point of view, too, the Colony has the advantage of reckoning among its settlers one of the most indefatigable and zealous collectors in Mr. James Drummond; and our pages are not wanting in communications from him, and in the narrations of his journeys and discoveries. Very recently we have been favoured with the correspondence of J. S. Roe, Esq., Surveyor-General of Western Australia, who, during part of the years 1848–9, was engaged in a survey of the interior, from the Swan towards Mount Russell, in longitude 123° 28′ W. Perhaps, had Mr. Fraser been required to state in what the Swan River district was deficient, he would have said, timber and coal within a reasonable distance of the Colony. The very expedition to which I now allude, of Mr. Roe, rendered the Colony the inestimable blessing of the discovery of both these commodities,—timber suited for naval purposes, and coal in considerable abundance, and in each case so near the coast as to render the transport both of the one and the other a matter of no difficulty.

Nor was Mr. Roe inattentive to the flora of the country he passed through. Fatigue and hardships, and want of facilities of conveyance, rendered it impossible to do more than here and there snatch up a few specimens, and preserve them in the best way circumstances would allow. These may be found worthy of notice in another place in our Journal. It may suffice to say now, that the species collected are remarkably well dried, and chiefly belong to the *Myrtaceæ*, *Leguminosæ*, *Proteaceæ*, and *Compositæ*. Many, as may be expected, are identical with those of Mr. Drummond from Swan River and King George's Sound. They were accompanied with a considerable collection of seeds, kindly destined by Mr. Roe for the Royal Gardens. The journal which we have received, commences at Cape Riche, on the south coast: it brings the party back to that place, and then includes the journey by a different route, following the direction of the Colliè River (where the naval timber was discovered), to Perth, the head-quarters on the Swan River. I regret that the nature of this Journal does not allow the introduction of a map, such as the very excellent one that Mr. Roe has sent, and the more so, because nearly the entire country is new. It may suffice to say that, after going from Cape Riche in a N.E. course to Bremer Range, in longitude 120° 30′ E., latitude 32° 35′

S., or thereabouts, the general direction then was S.E. to Russell Range, longitude 123° 28′, latitude 33° 30′. The return from this point was near to, or parallel with, the south coast (with occasional deviation) to Cape Riche, at no great distance from which, on the Fitzgerald River, the coal was detected.—Ed.

My letter*, of 12th October, 1849, from Cape Riche, will have made you acquainted with our movements up to that date. On the 14th of the same month, having rested those of our horses that required it, supplied ourselves with materials for light calico and dungaree tents, instead of the heavier ones we had brought from Perth, and discarded every article we could possibly dispense with, we took leave of our hospitable friends, Mr. and Mrs. Cheyne, and started from Cape Riche with ninety days' supplies for six persons, and three hundred pounds of horse-corn; the whole to be carried by our eleven horses, who were to complete their bait at the first well-grassed spot which appeared suited for the purpose. Such a place presented itself on the 15th at Yunganup, on the Pallinup River, and we remained there until the morning of the 18th, completing our preparations. It is in latitude 34° 24′ 6″ S., 15 miles N. by E. from Mr. Cheyne's farm, and has a limited quantity of excellent grass, in a small valley tributary to the Pallinup, which was here slightly brackish, in long, deep pools, 80 or 90 yards across, abounding in black swans, ducks, and teal. While at the camp, a Cape Riche native, known as "Bob," who had engaged to form one of our party to the eastward, was visited by several of his friends from Doubtful Island Bay and other parts, including two who had walked with him from what he represented to be the neighbourhood of Middle Island; but as I could gather from them nothing more as to the nature of the interior country than Bob himself was able to communicate, I did not regret my inability to engage the proffered services of one of the two, who offered to accompany me also, and who had previously gone with Mr. Bland and Dr. Von Sommer to the neighbourhood of Mounts Barren.

Despatching by them to Cape Riche our final letters for the Swan, with a suitable inducement to ensure a safe delivery, we began on the evening of the 18th to ascend the Pallinup, in the hope and belief it would lead us to the N.E. In seven miles we quitted the main river,

* Addressed, as the whole is, to the Colonial Secretary of the Swan River Settlement.

coming in long open reaches from the westward, between grassy banks, and ascended a branch coming from the N.E., where we soon found ourselves amidst the white and red sandstone cliffs of the coal formation, and continued so for the next six miles, when we encamped just in time to escape the severity of heavy stormy weather which set in from the N.W., with much rain. This continued, and detained us in camp during next day,—a respite which was to myself personally acceptable, as I had caught a violent cold by incautiously sleeping in wet clothes. Whilst ascending this river, we carefully examined every accessible cliff for coal-shales, but could discover no approach to them, the strata in this space being apparently too remote, and having no perceptible or decided dip in any direction.

Finding we were led too far N.W. by following up this branch, we quitted it on the 21st, 13 miles further north, coming from the N.N.W., through a valley of good soil and grass, 300 yards wide, with scrub on each side, the channel being filled with granite and whinstone, and the water high-coloured but brackish. Kangaroo and emu numerous.

Steering N.E., we crossed several small fresh streams, running to the S., in good grassy valleys, and at noon, in latitude 34° 4′ S., came on one of large size, in a more considerable valley of good soil, well grassed. It was running to the E.N.E., in a stream rather brackish, and, according to our native companion, flows into Bremer Bay, 45 miles to the S.E. I did not therefore follow it, leaving its further examination for my return westward, should circumstances then permit.

We had now decidedly left all indications of the coal-formation behind us, and were in a granite and quartz country of greater elevation, sheets of the former spreading out on the surface, and the latter blended with it. Pushing to the N.E., we crossed several fresh tributaries to the above river, occupying good grassy valleys, and encamped 10 miles further on, upon a northern branch of the same river, fresh, in a grassy valley of good brown soil, timbered with yeit, casuarina, and wattles. The former is a species of the extensive *Eucalyptus* family, with a dark, rough, netted bark, and is always welcomed by the traveller, as growing in good soil, and amongst grass.

On passing over the first ridge on the following morning, we were gladdened by the view of a large extent of good grassy country to the N.E., lightly timbered, and at this time well watered by a river and its numerous branches. It is known to the natives as Jeer-a-mung-up. Entering upon it immediately, we descended for two miles and a half

by a well-grassed valley, with beautiful lightly wooded hills or slopes on either hand, and then reached the main river, slightly brackish, in a granite rocky bed, and scarcely running to the S.E. Grasses of the best description filled its valley, and extended up the sides and over the tops of the gently rising hills on each side, which, as well as the valleys, were lightly wooded with yeit, casuarinas, and black wattles. Finding from Bob that this stream flowed S.E. to the sea, near Middle Mount Barren, I left the lower part of it for future examination, and traced upwards to the N.W. by N., amongst rich grass and soil for three miles, when, finding the grassy breadth decrease, and the river coming from N.N.W., I proceeded up a running branch in a N.N.E. direction, and near the junction observed the latitude at noon to be 33° 54′ 52″ S., samphire and rushes filling the bed of the stream, and indicating a want of permanency in the good water. This being Sunday, we encamped at one o'clock for the remainder of the day, well satisfied at having seen between 12 and 15,000 acres of excellent grazing country during the late seven miles and a half of our journey, with a prospect of its being much more extensive, especially downwards. Our native, who had crossed this river near its mouth, reports the land there to be good, which leaves room for a just inference that the intervening space of 35 or 40 miles may be good also.

On the 23rd I followed this branch upwards to the E.N.E. for four miles further, where the grass and water had gradually diminished so as to render its further examination of little importance, and I again steered north-eastward, a cloudy observation at noon giving the latitude about 33° 53¼′ S., and a high hill about Mount Barren bearing N. 104° E., 45 or 50 miles distant. The country as we proceeded was poor and scrubby, with some exceptions; and we encamped late, on a chain of salt and brackish pools, dipping eastward in a country almost level.

Following these pools down next day, they soon joined a continuous river of brackish water, between banks of granite or sand 20 to 30 yards apart, coming from the N.N.W., and flowing eastward and S.E. through open scrubby plains, joining the river which we had seen on the 22nd many miles lower down, according to the information of our native. The weather, which had been very threatening during the morning, drove us to an encampment earlier than usual, for after two hours' rain the country was scarcely passable for the horses.

Almost continuous rain from the S.E. fell during the remainder of

this day and on the 25th, frequently bogging our horses in the hollow places while seeking their food: I did not therefore attempt to break up the camp until the following morning, when the wind had veered round to the S.W., and the rain ceased. We then resumed our N.E. route, passing over for the most part open sandy downs or plains, separated by very dense thickets, through which the axe was in frequent requisition to clear a way for the horses. The country was high and level, watercourses had disappeared, and their place had been supplied by numerous small salt or samphire lagoons; and upon one of the former we were compelled to encamp, with nothing but long coarse rushes for the horses, and brackish water which oozed into our wells. Water was however speedily supplied in abundance by a most severe thunder-storm, which seemed to vent its whole fury in the very midst of our little party; the lightning darting through and amongst our tents in fearful flashes, and the frequent deafening thunder-claps threatening the destruction of everything around.

On the 27th the salt-lakes and swamps increased in number and size as we proceeded N.E.; but after four miles they ceased, and our route lay up a long ascent, to a country of much greater elevation, but of poor quality, covered with scrub and dense thickets, without timber. Thick showers following each other in rapid succession greatly obstructed our view, but the surrounding country for at least two or three miles appeared to be of the same description. While despairing of being able to feed our horses better than the night before, we unexpectedly arrived at a small fresh lake, surrounded by good grass in a clump of trees, and gladly encamped there at once, having travelled upwards of 16 miles since the morning without seeing either grass or water, notwithstanding the rain which had fallen nearly all day.

At two miles N.E. from our camp, we were gratified at coming upon some good grass, and a deposit of rain-water, in a clump of yeit-trees, and in observing the appearance of a small grassy granite hill to the northward of our route; circumstances in themselves very trivial and unimportant in a general point of view, but to us all-important, as giving promise that their recurrence would afford us the means of sustaining our horses. We however encountered nothing but scrub and thicket for the next 14 miles, when we were again fortunate in discovering, amongst the many places examined, some good grass and a native well, in a clump of yeit, where we immediately encamped.

By two stars on the meridian, the latitude of this spot was 33° 23′ 6″ south. I should gladly have set apart the next day (Sunday, 29th of October) as a day of rest, for many reasons, including that of drying our provisions, which had become very wet on their passage during the last three or four days through the rain and wet bushes; but, independently of the small patch of grass immediately round our camp having been all eaten close off, the weather continued too unsettled to hold out a prospect of my being able to accomplish the desired object effectually. I therefore moved on N.E. in the morning, and at the end of two miles and a half obtained an extensive prospect from the summit of a sandy plain, of the country in advance between N. by W. and N.E. by N. We were however neither gratified nor encouraged by observing that, to the distance of 16 or 18 miles, which limited our view, the country appeared of the same description as that just passed over, the extensive undulating plains being occasionally diversified by dark lines of vegetation, probably only marking the thickets which separated them; but two miles further N.E. we sighted some extensive white sandy lakes five or six miles to the N.W., evidently salt, as also a lofty red granite hill, at the same distance, bearing N. 80° E. Despatching Messrs. Ridley and Gregory to ascertain the nature of the lakes, I conducted the party to the granite hill, which I had the pleasure to name Mount Madden, in compliment to my honourable friend the Colonial Secretary of Western Australia, who had taken a warm interest in the expedition. On my way, I passed several large granite sheets, with only short mossy grass about them, but abundance of rainwater collected in the cavities, and in some places forming small running streams, the result probably of the recent rains. A clear open lake, three miles in length, was left a mile to the northward, soon after which we crossed with considerable difficulty over a broad wooded flat three miles wide, evidently connected with its waters during very wet seasons, but now dry, and much encumbered with dead trees and brushwood, both erect and prostrate. A long and very fatiguing ascent of a mile and a half, through close thickets or soft boggy land, brought us at length to the base of the granite mass, where our disappointment was great at finding only sufficient grass to give our horses a scanty feed during the night.

(To be continued.)

Vine Disease.

M. Tulasne has had the goodness to communicate to us his "*Notes on the Fungus which causes the Vine Disease*," extracted from the "Comptes rendus des Séances de l'Académie des Sciences, vol. xxxvii., Séance du 17 Octobre, 1853," of which the following is a translation:—

The Fungus which has committed such ravages on the Vine, and which is now well known under the name of *Oïdium Tuckeri* (Berk.), consists of a network (*mycelium*) of white loose filaments, which covers, here and there, the green and healthy parts of the vine, and causes the formation of brownish or blackish spots. From these filaments, which are all superficial, or external on the epidermis of the infested plant, spring thick tufts of simple, stiff, pointed stalks, the ultimate point of each of which quickly becomes a large oval cell, as capable of propagating the fungus as any true seed could be. Independently of these reproductive bodies, the *Oïdium Tuckeri* produces brown, generally pedicellate fruits, coated with a cellular membrane, and containing very minute seeds, equally capable of germinating. These fruits are commonly larger than those swollen acrogenous bodies which are described above, but they are not always so: they are of the same form, and are often borne on the selfsame footstalk, almost appearing as if they were caused by a transformation of the normal seeds. M. Cesati was the first, I believe, to recognize the existence of these fruits; but he did not suspect that they belonged to the *Oïdium*, but attributed their presence to the reproductive organs of a peculiar fungus, to which he gave the name of *Ampelomyces Quisqualis* (see Klotzsch's Herb. Viv. Mycol. Cent. xxxvii. no. 1669, b. anno 1851). M. Amici has, since, correctly referred them to the *Oïdium Tuckeri*, of which he considers them to be the most perfect organs of propagation (see the Atti dei Geografi di Firenze, vol. xxx. anno 1852). I have myself found these peculiar organs on the Vines which were diseased in the environs of Paris, and, in common with the above-quoted authors, I have seen that they were sometimes elongated, and sometimes globular, and that among the latter, several were perfectly spherical, and sessile on the byssus which engenders them. These observations have led me to the conclusion that *Oïdium Tuckeri* (Berk.) is of a very different nature from the view which other writers have hitherto taken of it. There is a genus of small parasitical fungi, common in our country, which, in their earliest

stage, differ in no respect from the byssoidal plant which infests the Vine. *Erysiphe*, for so the genus is now called, generally produces an equal number of acrogenous and ovoidal seeds, as of brown, polysporous conceptacula, precisely as is above described. Numerous investigations, principally made on *E. pannosa*, Fr., *E. Knautiæ*, Dub., *E. guttata*, Wallr., *E. adunca*, Grev., *E. holosericea*, Fr., *E. Berberidis*, DC., *E. Prunastri*, DC., *E. lampocarpa*, Wallr., and *E. Martii*, Lev., have proved to me that the fruits in question are very polymorphous in the same species of *Erysiphe;* that they may be either cylindrical or elongated, simple or bilocular, naked or surmounted with a row of cells, ovoid, or globular, or perfectly spherical; that some of the latter are destitute of a filiform appendage, while others, furnished with the same distinguishing hairs as the theca-bearing fruits, resemble the latter so closely as to be indistinguishable by external characters.

Many Mycologists still doubt whether those ovoid grains, which cover with a white dust the filamentous thallus upon which the ascophorous conceptacula of the *Erysiphe* are afterwards seen, can really appertain to these Fungi. They incline to the opinion that these grains, and the white byssus which produces them, constitute together a peculiar and perfect plant, a fertile *Oïdium*, of which the *Erysiphe* would be merely a parasite, or a more tardy accompaniment. This opinion is bolstered up by the assertion, that Fungi possess only one kind of reproductive organ; but it is an opinion which is daily losing credit.

Many cogent reasons militate against the *Erysiphes* being looked upon as parasites, or merely as frequent accompaniments of the *Oïdium*.

In the first place, the circumstance of their being constantly found together, as the *soi-disant Oïdium leucoconium*, Desmaz., with the *Erysiphe pannosa*, Fr., the *O. monilioides*, Lk., and *E. Graminis*, DC., etc., is so unvarying as to imply a necessary connection between these minute vegetables, so that if the *Oïdium* were a distinct plant from the *Erysiphe*, the latter would certainly be its parasite. It would also be our endeavour to distinguish, in the *mycelium*, which bears simultaneously the stringed grains of the *Oïdium* and the fruits of the *Erysiphe*, any filaments peculiar to each; for a minute scrutiny will prove that the conceptacula of *Erysiphe* proceed positively from the very filaments which elsewhere produce the pedicels which germinate into naked spores.

To be convinced, in the second place, that there is no real parasitism in the case, nor two distinct and associated vegetables, but only one

kind of plant, which is endowed with several reproductive organs, it is sufficient to consider those polysporous fruits which I have already mentioned, and which vary so greatly in form, as to present all the possible intermediate stages between the spores of the pretended *Oïdium* and the ascophorous conceptacula of the *Erysiphes*, which latter are the most perfect organs of reproduction granted by nature to these Fungi. These same polysporous fruits, being found at once among the *soi-disant Oïdiums*, as peculiar parts of their strings of spores, and among the fertile *Erysiphes*, as conceptacula externally identical with their perithecia, do manifestly unite the *Oïdiums* to the *Erysiphes*, and they afford the best evidence that both appertain to the same genus of plants. In other words, the organs in question do not constitute, as M. Amici would have it, the reproductive apparatus, *par excellence*, of the *Oïdiums*, but they belong really to the *Erysiphe*, as legitimately as the naked spores of *Oïdium*, and represent a mode of propagation which holds the middle place, between these latter, and the thecigerous conceptacula. It results, from this ascertained fact, that the *Erysiphes*, as well as many other Fungi, possess at least three distinct modes, or three special sets, of organs for reproduction. To take them in the order of their successive development, the first and simplest is that which consists in naked spores, arranged in moniliform series, and which I have denominated *conidia:* then come the conceptacula, of very various forms, filled with innumerable and extremely minute granules, and which I call *pycnidia;* and finally, we see the most perfect globular and black seeds, from the heart of which are engendered one or more oligosporous thecæ (see my "Animadversiones" on *Erysiphe*, in the Berlin Botanische Zeitung, vol. xi. p. 257–267).

This being admitted, it is evident that the *Oïdium Tuckeri*, Berk., with its naked acrogenous spores and its polysporous fruits, represents an *Erysiphe* reduced to its two secondary modes of multiplication; so that the most important gap, which remains to be filled in the history of this pest of our vineyards, will consist in deciding which species of *Erysiphe* supplies the deficiency. And till its ascophorous fruits shall have been observed, its species cannot be satisfactorily ascertained; for the two other kinds of propagation are insufficient to distinguish it from many of its congeners, which are furnished with precisely the same*.

* Whatever be the species of *Erysiphe* to which we must refer that which infests the Vine, the absence of its ascophorous fruits is not a peculiar or unwonted cha-

If the fungus of the Vine be an *Erysiphe*, there is no reason to be surprised at its injurious effects; for the genus is eminently parasitical*, and it always causes such a disturbance in the vitality of the plants on which it feeds, as to produce more or less serious mischief to them.

Everybody knows the damage which is often done to the cultivated Hop by *Erysiphe Humuli*, DC., to the Sycamores by *E. bicornis*, Wallr., to Hawthorn by *E. clandestina*, Fr., and by *E. Pisi*, DC., to the later crops of peas. The disease which is so ruinous to the Peach-tree, and which cultivators call mildew (le Blanc), is apparently caused solely by *Erysiphe pannosa*, Fr., a species which is very prejudicial to rose-bushes, and which produces abundantly the *conidia*, *pycnidia*, and the *thecigerous conceptacula*. No one, as far as I am aware, has ever hesitated to attribute the atrophy, the malformation of parts, and the sterility, all of which succeed the attacks of *Erysiphe*, to aught but those Fungi; why should that species which infests the Vine be less injurious? and why seek further for the damage which the stem so infested invariably manifests? It is a most gratuitous supposition, that the Vine must be diseased *before* this parasite attacks it; and this improbable conjecture must equally extend to the many other wild or cultivated plants on which other species of *Erysiphe* prey; as in like manner to those vegetables which afford a nidus to the various species of *Uredo*, *Rhytisma*, *Ustilago*, many kinds of leaf-inhabiting *Sphærias*, and a multitude of other parasitical Fungi. Doubtless, it may be admitted, that these pests do not attack indiscriminately every individual of the species which they inhabit; and that the health, and age, and locality, and physiological condition of the plants have some influence on the development of the Fungus; but this general qualification, while applying to many peculiarities in these little vegetable productions, ceases to be of force, when their enormous diffusion assumes the character of a universal scourge, and becomes a phenomenon, alike beyond our knowledge and control.

racter; for there are several, as *E. Martii*, Lev., *E. communis*, Fr., *E. lampocarpa*, Dub., etc., and which are often in the same predicament, whether it be owing to the plants which sustain them, the spot where they grow, or other undetermined causes.

* In several of the species, the filaments of the *mycelium* are furnished with small round appendages, probably organs of suction. They are especially visible in *E. Martii*, Lev., and *E. communis*, Lev. Both M. Gasparini and M. Mohl have seen them in the Vine, where, indeed, they are very perceptible.

Remarks on PASSIFLORACEÆ *and* TURNERACEÆ; *by* BERTHOLD SEEMANN, PH.D., F.L.S.

All botanists consider *Turneraceæ* and *Passifloraceæ* as allied to each other, but few seem to be aware that these Orders are so closely related as they really are, that the differences between them are merely imaginary, that in fact they constitute one and the same natural family of plants. I was led to this conclusion by the discovery of the American genus *Erblichia*, Seem.,—figured in plate xxvii. of the 'Botany of H.M.S. Herald,'—and by subsequent examination of several *Turneraceæ*.

All *Turneraceæ* are described in systematic works as "Herbaceous plants, having sometimes a tendency to become shrubby." This description however applies to only a few Turneras; *T. salicifolia*, St. Hil. (*T. Hindsiana*, Benth.! *Corchorus grandiflorus*, Spring!) is a real shrub from 6–8 feet high, and *Erblichia odorata*, Seem., is a good-sized tree, often attaining a height of 30 feet or more. The leaves are said to be exstipulate,—another mistatement, as all *Turneraceæ* have stipules. In *Turnera ulmifolia*, Linn.,—a common hot-house plant, from which solely most authors seem to have derived their knowledge of this group,—they are, on account of the hairy covering of the stem, hardly visible, but in the more glabrous species, such as *T. salicifolia*, St. Hil., they are plainly to be seen, and in *Erblichia odorata*, Seem., they are still more manifest. The calyx is, in *Turnera* and *Piriqueta*, monophyllous, in *Erblichia* pentaphyllous. The latter is doubtless the normal state of the calyx of the Order; for if the calyx of the two former is examined, it will be found that its lobes are in fact true sepals, traceable to the very base, and but slightly connected with each other. The petals and stamens are stated to be inserted into the tube of the calyx, but if examined closely they will be found, although attached to the calyx, to be traceable to the stalk of the ovary. In *Erblichia*, which has no calycinal tube, and where the petals and stamens are free to their very base, this mode of insertion becomes still more apparent. Indeed, if the insertion was different from what I have stated it to be, we should have to remove *Turneraceæ* from their hypogynous alliances, where they now stand, and place them among the perigynous orders, with which they seem to have no connection,—a change which those who follow the views of Lindley, as laid down in his 'Vegetable Kingdom,' would

be compelled by logic to adopt. The petals of *Turnera* and *Piriqueta* are without appendices, but those of *Erblichia* are furnished at their base with filamentous processes, analogous to the corona of the true Passion-flowers. The stigmas of *Piriqueta* and *Turnera* are more or less flabellate; those of *Erblichia*, although having a tendency to become so, are capitate, and merely fimbriated on the margin; while it must be borne in mind that the stigmas of several *Passifloraceæ* have a tendency to become divided, and occasionally bilobed.

Turneraceæ then are intimately connected with *Passifloreæ*, especially with the tribe *Paropsieæ*. The connecting link between them appears to be *Erblichia*, one of those peculiar genera, the discovery of which will always produce great changes. As no other points of difference, besides those already disposed of, seem to exist between the two Orders, I have no hesitation in uniting *Turneraceæ* and *Passifloreæ* into one Natural Family, adopting the name *Passifloraceæ* for both.

It is evident that the discovery of *Erblichia*, and the consequent union of *Turneraceæ* and *Passifloreæ*, throw a new light upon several disputable points regarding the floral envelope of the latter, and strengthen the views of Lindley, who regards the outer floral envelopes as calyx, the inner as corolla, and the corona as a peculiar kind of petals.

BOTANICAL INFORMATION.

Plants of Brazil.

We have been requested to insert the subjoined prospectus, issued on the part of Mr. J. Reinhardt, Curator of the Zoological Department of the Royal Museum of Natural History at Copenhagen, and advantageously known as one of the Naturalists on board the Danish Corvette "Galathea," on her late voyage of circumnavigation, and by several interesting memoirs, of which he is the author.

Intending subscribers for shares are invited to communicate their wishes to us, or to Dr. Wallich, 5, Upper Gower Street, London.

Prospectus.

The coast provinces of Brazil have been visited by many botanists,

who have enriched the collections of Europe with large accessions of plants and animals. But the interior of that vast country has not been examined at all, or to a very limited extent only by rapid travellers, who were able to gather but few of its products. It cannot be doubted, therefore, that very rich results in botany and entomology would be obtained, if an experienced person were to sojourn, for that express purpose and during a considerable period, in the north-west parts of the provinces Minas and Goyaz, and if possible in Mato grosso. Of this, a scientific expedition of three years to Brazil has entirely satisfied me; and I accordingly now beg to invite the Naturalists of England to support a plan, which it is to take effect in next spring, when, if I succeed in obtaining a sufficient number of subscribers to shares in the undertaking, I intend starting from Hamburg for the Brazils.

I propose spending three years on the expedition, making those parts of Minas Geraes and Goyaz, which are situated beyond the Francisco river, the principal localities for my labours, extending, if not prevented by the state of the country, as far north as practicable in the river-valleys of Goyaz, Tocantin and Araguaya. But I will sojourn likewise at other places which may offer a rich botanical and entomological harvest; experience having taught me that a lengthened stay alone admits of a systematic, extensive plan for making collections, while even the richest tracts yield comparatively little to the transient visitor. In case the time and means at command permit it, I hope to penetrate into the province of Mato Grosso; but since the portion of Goyaz and Minas, which it is my intention to examine in the first instance, contains an area exceeding three times that of Great Britain, it will be impossible at present to determine the plan and route in detail. My collections will consist, partly of dried plants, and partly of seeds, also of insects, made to such an extent, and with such selection, that the shareholders may be amply supplied, and at so early periods in succession, as can be effected by frequent transmissions; which will secure to them their annual supplies in the course of each year. The amount of each share will be £36, being at the rate of £12 per annum, of which, however, only the first year's subscription will have to be anticipated; the second and third instalments, of £12 each, are not to be paid until the shareholders shall have received the collections of the first and second year. It will be at the option of the subscribers to determine, whether they desire to receive insects or plants; and further, I

will engage to furnish particular families of either, if preferred. I believe that about 3000 insects, or 1000 dried plants in a proper state of fructification, with a ticket indicating the locality and time of gathering, and in all other respects complete and well preserved, will be considered as a fair return for one year's payment of each share.

Finally it is my intention, if particularly desired, to make collections of such living plants as can be transported by land from the interior of Brazil, such as Orchideæ and the like; but as the expenses of transport must naturally be very great, they cannot be covered by the above-mentioned amount of the shares. The load of a mule will be two cases of such plants, each of which will have to be paid at the rate of £30, besides freight from Rio Janeiro to Europe; one half of the sum named to be paid in advance, the other on receipt of the case.

In order that no time may be lost, I solicit that gentlemen intending to subscribe to the above scheme, will favour me with their orders on the subject, together with a remittance through the house of business of Messrs. Schmidt and Le Maire at Copenhagen, with instructions to pay the amount into my hands, when the time of my departure shall have been finally determined.

J. Reinhardt.

Intending subscribers are requested to state,—1, their name and address; 2, number of shares desired; 3, what description of collections is required, and 4, whether they wish to receive living plants.

Copenhagen, December, 1853.

Bourgeau's Spanish Plants.

The following Circular has been issued by M. Bourgeau on the distribution of his beautiful collections made in 1853.

"L'Association Botanique Française d'Exploration vient de terminer le partage des Collections recueillies, en 1853, par son voyageur, M. Bourgeau, dans le voyage annoncé par la Circulaire du 1er Octobre, 1852. M. Bourgeau a exploré la province des Algarves, en Portugal, et a été à même, à son passage en Andalousie, de recueillir plusieurs espèces intéressantes. Les Collections, qui contiendront plus de 300 espèces, seront remises, sous peu de jours, à tous les souscripteurs; M. Bourgeau enverra en même temps, à moins d'avis contraire, une

centurie de plantes de choix recueillies, d'après ses indications, à la Sierra Nevada, par M. Pedro del Campo; cette centurie renfermera un assez grand nombre de plantes qui n'ont pas pu être recueillies, en nombre, lors de l'exploration de cette riche contrée, en 1851. Le nouveau voyage, qui sera entrepris en 1854, a pour but l'exploration du plateau central de l'Espagne et des principales chaînes de montagnes des deux Castilles. M. Bourgeau ne devant recueillir que les plantes rares et celles qui sont propres à la région, ne croit pas rapporter de ce voyage plus de 300 espèces. Toutes les plantes seront déterminées avec soin par des botanistes connus, et munies d'étiquettes imprimées; chaque étiquette portant un numéro d'ordre et le nom du botaniste à qui l'on doit la détermination.

"Les conditions de la souscription seront les suivantes. Les Botanistes qui désirent avoir droit aux collections les plus complètes devront verser, entre les mains de M. Bourgeau, une somme de 50 francs au moins. En raison du grand nombre des souscripteurs aux collections ordinaires, M. Bourgeau ne peut recueillir de collections complètes que pour les personnes qui auront effectué ce premier versement. Toutes les collections seront d'ailleurs réparties d'après l'ordre d'inscription sur la liste de souscription. Les souscripteurs qui ont déjà versé 50 francs, imputables sur le prix des collections de la présente année, n'auront qu'à acquitter le prix total de la collection qui leur sera adressée, pour être placés sur la liste de souscription, au même rang que celui qu'ils y occupent déjà.

"E. BOURGEAU.

"Rue Claude, No. 14, au Marais, Paris."

British Hieracia.

Mr. George Gilbert Baker announces, price 10*s.* 6*d.*, a *Fasciculus of dried Specimens of the* Hieracia *of North Yorkshire and Teesdale.* "In genera like *Hieracium*, the species and groups are distinguished from one another, less by the persistence of their diagnostic characters, than by the habit and appearance proper to each. Therefore their peculiarities can be conveyed but imperfectly by verbal description alone: and the species can scarcely be determined in a satisfactory manner without further assistance than can be afforded by written characters. For this reason great difficulty is experienced in obtaining a knowledge

of the more intricate genera: and consequently those which most require investigation are frequently passed over and neglected. In the hope of supplying in some degree a series of British *Hieracia* for refeference, on the plan of the "Herbarium Normale Sueciæ" of Fries, is furnished the present fasciculus, which is composed of those forms of which a sufficient number of specimens could be procured, within what is probably, whether as regards individuals or species, the richest district in Britain of equal extent as regards this genus.

"The names of subscribers may be forwarded, with clear directions as to the mode by which their copies are to be conveyed, to the Editor, John Gilbert Baker, Thirsk, or to the publisher, William Pamplin, 45, Frith-street, Soho-square, London, to either of whom Post-office orders may be made payable.

"List of Species.—*Pilosella:* H. Pilosella, *L.;* H. aurantiacum, *L. Aurella:* H. iricum, *Fries. Pulmonaria:* H. pallidum, *Biv.;* H. murorum, *L.;* H. cæsium, *Fries;* H. cæsium, *Fries* (nemorum, *Fries*); H. vulgatum, *Fries* (H. maculatum, *Sm.*); H. vulgatum, *Fries*, et var.; H. vulgatum, *Fries* (medium, *Fries*); H. vulgatum, *Fries* (maculatum sylvaticum, *Sm.*); H. vulgatum, *Fries* (H. sylvaticum, *Sm.*); H. gothicum, *Fries. Accipitrina:* H. tridentatum, *Fries;* H. tridentatum, *Fries* (nemorosum); H. umbellatum, *L.;* H. umbellatum, *L.*, et var.; H. crocatum, *Fries;* H. crocatum, *Fries* (angustatum, *Fries*); H. boreale, *Fries;* H. boreale, *Fries* (nemorosum)."

Linden's South American Plants.

M. Linden, of the Société Royale de Zoologie et d'Horticole of Brussels, who continues to send Collectors to explore the botanical treasures of South America, announces the following

"COLLECTIONS BOTANIQUES.

"Mexique.—Plantes sèches recueillies par J. Linden, dans les Etats de Vera-Cruz, Puebla, Mexico, Yucatan, Tabasco et Chiapas: la centurie d'espèces, 40 francs.

"Nouvelle-Grenade et Venezuela.—Plantes recueillies par J. Linden, dans les provinces de Caracas, Carabobo, Barquisimeto, Truxillo, Maracaibo, Merida, Pamplona, Socorro, Velez, Tunja, Bogota, Mariquita, Cauca, Ocaña, Rio Hacha, et Santa-Martha: la centurie d'espèces, 45 francs. Plantes du voyage de N. Funck et L. Schlim: la centurie d'es-

pèces, 45 francs. Plantes du voyage de L. Schlim, dans les parties inexplorées de la Nouvelle-Grenade, depuis 1848 jusqu'en 1852: la centurie d'espèces, 45 francs. Plantes collectées par J. Triana, dans les provinces d'Antioquia, Cauca, Choco, etc., en 1852 et 1853: la centurie d'espèces, 50 francs.

"Indes Occidentales.—Plantes recueillies par J. Linden, dans les Montagnes Bleues de la Jamaïque, dans les parties occidentales de l'île de Cuba, ainsi que dans la province antérieurement inexplorée, de Santiago de Cuba: la centurie d'espèces, 45 francs.

"Collections spéciales.—Telles que: Fougères et Lycopodes, Orchidées, etc.: la centurie, 50 francs. Mousses, Algues et Lichens: 30 fr.

Death of Professor Moretti.

The 'Gazzetta di Milano' announces the death of Professor Joseph Moretti, at Pavia, on the 1st of December.—*Bonplandia.*

NOTICES OF BOOKS.

Die Familie der TREMANDREEN, etc. *The Family of* TREMANDREÆ, *and their relationship to the* Lasiopetaleæ, *a contribution to the development of the Natural System of Plants; by* JOACHIM STEETZ, M.D., etc.

Dr. Steetz is a physician of considerable practice in Hamburg, who devotes the few leisure moments his profession affords, to the pursuit of his favourite study of botany, with great zeal and success. He some years since very carefully worked up, for the 'Plantæ Preissianæ,' several families of Swan River plants, and amongst others the *Tremandreæ.* Observing in a paper of M. Payen's, in the Annales des Sciences Naturelles, Ser. 3. vol. xiv. (*Organogénie de la classe des Polygalinées*), that that author drew, partly from his monograph, conclusions relating to the structures and affinities of *Tremandreæ*, which Dr. Steetz does not believe to have been warranted, he has been induced to investigate the subject with great care. The rich materials he has now had at his disposal, much more abundant than those he could examine when describing Preiss's plants, have confirmed him in the views he then entertained

of the close connection between *Tremandreæ* and *Lasiopetaleæ*, and the development of these views forms the object of the present pamphlet of about one hundred and twenty pages. The history and generic characters of the three Tremandreous genera *Tetratheca, Platytheca* and *Tremandra* is given in great detail, the various affinities indicated by different botanists are discussed, and an elaborate comparison is instituted between the *Tremandreæ* and *Lasiopetaleæ*, in each of their different organs, vegetative as well as reproductive, in their anatomical structure, and the whole subject is argued in a satisfactory, though perhaps rather diffuse manner.

Etudes Organiques sur les CUSCUTES; *par* M. Charles Desmoulins, Président de la Société Linnéenne de Bordeaux, etc.

This is an historical and systematic monograph of the European species of the Linnean Genus *Cuscuta*. The characters of each are given in detail in seventeen folded tables, and supported by elaborate arguments, authorities, and observations, contained in seventy-seven pages of text, as reprinted from the Reports of the 19th Session (at Toulouse) of the French Scientific Congress. M. Desmoulins is a careful observer, well known for several critical works on the Flora of the south-western provinces of France, and great reliance must be placed on his facts and observations. We should not perhaps be disposed to agree with him, and some other modern botanists, in the expediency of breaking up into small genera so very natural a group as the Linnean *Cuscuta;* nor perhaps can the merits of these genera, even as sectional groups, be fully ascertained until they are tested by application to a larger proportion of the numerous exotic species now known; but so far as the European species are concerned, they appear to be well characterized, and as natural as the circumstances of the case will admit. The fifteen species examined and adopted by M. Desmoulins, are *Cuscuta Europæa, epithymum, trifolii, planiflora, Kotschyi, Godronii, episonchium*, and *calycina; Epilinella cuscutoides* (*Cuscuta epilinum*); *Monogynella Vahliana* (*Cuscuta monogyna*); *Cassutha* (*Engelmannia*, Pfeiff.) *suaveolens, Americana, chrysocoma* and *Arabica*, and *Succuta alba;* besides three doubtful species not seen by the author, viz. *C. approximata*, Babingt., *C. microcephala*, Welw., and *C. Viciæ*, F. Schultz. It

is probable that further observation may reduce a few of these to the rank of races or varieties; and if the genera be admitted, the adoption of the name of *Cassutha* can hardly be justified by the side of the pre-existing *Cassytha*, a Cuscuta-like genus of *Laurineæ*.

M. Desmoulins' paper is wholly phytographical; the important physiological questions connected with the peculiar mode of growth of these curious parasites are not entered into.

WALLACE, ALFRED RUSSEL: *Palm Trees of the Amazon, and their uses.* With 48 plates. Small 8vo. London: Van Voorst. 1853.

He must be a bold man who would undertake a work on Palms after the splendid and scientific volumes of the illustrious Von Martius. The present however is of a very humble character, undertaken by one who was, during his travels on the Amazon and its tributaries, from 1848–1852, "principally occupied with the varied and interesting animal productions of the country." The Palms (and no wonder) soon attracted his attention, as the most striking and characteristic feature of the tropical forests. "In this little work," the author tells us, "careful engravings from my original drawings are given, with a general description of each species, and a history, from personal observation, of the various uses to which it is applied, and of any other interesting particulars connected with it. For the determination of the genera and species, and for that part of the Introduction relating to the botanical characters and geographical distribution of Palms" (and assuredly for the map of America, showing the distribution of Palms) "I am indebted to the magnificent work of Dr. Martius." The chief merit of the work will be found to consist in the "accurate sketches" of the trees themselves, and in the accounts of the uses of certain of these; and if the former are as faithful as Mr. Fitch's lithographs are clever (though very slight), we are thankful for such a series of plates. But we do not see how, with apparently no knowledge of these Palms except from their external forms (often without flower or fruit), an author could refer many of them to species characterized by Martius, or how he could ascertain that his species, so called, are really "new;" for any study or sketches of flowers or fruit seem to be entirely neglected, and the only figures given of them (and most prettily and faithfully executed by Mr. Fitch) are confined to the latter (fruits), some dozen

of kinds copied from specimens in the Museum of the Royal Gardens of Kew: and these occupy two plates apart from the species to which they belong. Fifty "species" are here noticed; and of these, fifteen are considered new. Among them is the "*Piassaba*, or Chíquichíqui of Venezuela" (*Leopoldinia Piassaba* of Mr. Wallace, Plate vi.), and not the *Attalea funifera*, as we had been led to believe, after much inquiry, as we have stated in the Journal of Botany for 1849 (vol. i. p. 121. t. 4), although that is the "Piaçaba" of southern Brazil, where its fibre appears to be employed for similar purposes. We do not in the least call in question the accuracy of Mr. Wallace's statement that his is the tree which now furnishes, on so large a scale, the brooms and brushes of modern days; nor are we able to deny its being a Palm hitherto unknown to Botanists; but we do complain that a Naturalist who is able "to make out its geographical range so exactly, from having resided more than two years among people whose principal occupation consisted in obtaining the fibrous covering of this tree, and from whom no locality of it can have remained undiscovered," should never have been at the pains to procure flowers and fruit for the illustration of so interesting a plant. The fruit too is said to be esculent, and employed to form a thick drink, by washing off the outer coat of the pulp; and the leaves form an excellent thatch, and are almost universally used in that portion of Venezuela on the upper Rio Negro. From that district several hundred tons of the fibre are cut annually and sent to Pará, from which place scarcely a vessel sails for England without its forming a part of her cargo. We trust Mr. Spruce, now in that country, will make up for this deficiency. Of the genus *Cocos*, Mr. Wallace tells us that few species of the genus are found in the Amazon district: yet he has taken no notice of them, but, instead, has given a plate of the *Cocos nucifera*, which is "not a native of South America, but cultivated there."

The work is certainly more suited to a drawing-room table than to the library of the botanist.

MACDONALD, GEORGE, ESQ., and ALLAN, JAMES, ESQ. THE BOTANIST'S WORD-BOOK: *an etymological and explanatory Vocabulary of the terms employed in the Science of Botany, for use in Colleges, Schools, and private Study*. 12mo. London: Lovell Reeve. 1853.

We certainly cannot compliment the authors of this little work by

an assurance that we think it likely to promote the study of Botany in Colleges, Schools, and those engaged in private study. Messrs. Macdonald and Allan complain of the difficulty of the study, from the use of so many words employed in it which are derived from the Greek and Latin; and "even the classical scholar, unless very deeply read, and comparatively fresh from his philological studies, must often feel greatly at a loss to decipher, and consequently to fix in his memory, many of the strange terms which Botanists have invented, gathered as they frequently are, not from the familiar walks, but from the bye-paths and obscure recesses of ancient classical literature. Had familiar English terms been employed, instead of obscure combinations of foreign vocables, the name of the thing and the thing itself would have been so associated in the mind of the learner, that the one would immediately suggest the other."—As an example of their meaning they say, "Had the expression *one-leaved* been adopted instead of '*monopetalous*,' or *uncovered* instead of '*achlamydeous*,' surely the distinctions thus denoted would be both more readily perceived and more easily remembered; and had similar familiar terms been uniformly selected, unquestionably Botany would have been the most easily attained of all the natural sciences." We believe however the most illiterate tyro in Botany (in respect of classical attainments) would be able to tell Messrs. Macdonald and Allan, that "*monopetalous*" does not mean *one-leaved*, and that the word "*uncovered*," applied to flowers we presume, would stand in as much need of explanation as *achlamydeous*. With such notions of botanical terminology, we do not wonder, in the brief "explanatory vocabulary," to see "NODOSE, *knotty;* a term applied to a particular form of *pubescence*." "OPERCULATE, having a cover like the antheræ (!) of Mosses." "CRISTATE; applied to a flower having a tufted crest like a cock's comb." "CORMUS; a bulbous root, which is solid throughout." "CONFLUENT; a species of foliation in which the leaves grow in tufts, so as to leave the rest of the stalk quite bare," etc. etc.

DE VRIESE, W. H., et P. HARTING; *Monographie des* MARATTIACÉES. Folio. Leide et Dusseldorf. 1853.

In this elaborate work, accompanied by nineteen plates, our valued

friends have given a full history of the group of Ferns denominated *Marattiaceæ*, "d'après les Collections du Musée Impérial de Vienne, de celui de Paris, de Sir William Jackson Hooker, de M. François Delessert, de M. le Dr. F. Junghuhn, de quelques principaux Jardins de l'Europe, et celui de Buitenzorg, à l'Ile de Java; suivie de Recherches sur l'Anatomie, l'Organogénie et l'Histiogénie du Genre *Angiopteris*, et de considérations sur la structure des Fougères en général."

Messrs. De Vriese and Harting divide the group of *Marattiaceæ* into three Sections. 1. MARATTIEÆ. Genera: *Marattia*, Sm., *Dicostegia*, Pr., *Gymnotheca*, Pr., *Stibasia*, Pr., and *Eupodium*, J. Sm. 2. KAULFUSSIEÆ. Genus: *Kaulfussia*, Bl. 3. ANGIOPTERIDEÆ. Genus: *Angiopteris*, Hoffm. (Angiopteris and Psidolochea, *Pr.*). A careful investigation of the numerous collections submitted to their investigation has led them to the determination of sixteen species of true *Marattia;* two of *Dicostegia;* nine of *Gymnotheca;* one of *Stibasia;* one of *Eupodium;* four of *Kaulfussia;* and no less than sixty of *Angiopteris*. The Recherches sur l'Anatomie, etc. of the Genus *Angiopteris*, are from the pen and pencil of M. Harting; and the same gentleman concludes the work with the "Considérations sur la structure des Fougères en général." The well-executed plates exhibit the anatomical structure of the group, as well as pinnæ of a great number of the species.

Some Notes upon the Cryptogamic *portion of the Plants collected in Portugal* 1842–50; *by* DR. FRIED. WELWITSCH. The Fungi, *by the* REV. M. J. BERKELEY. London: W. Pamplin. 1853.

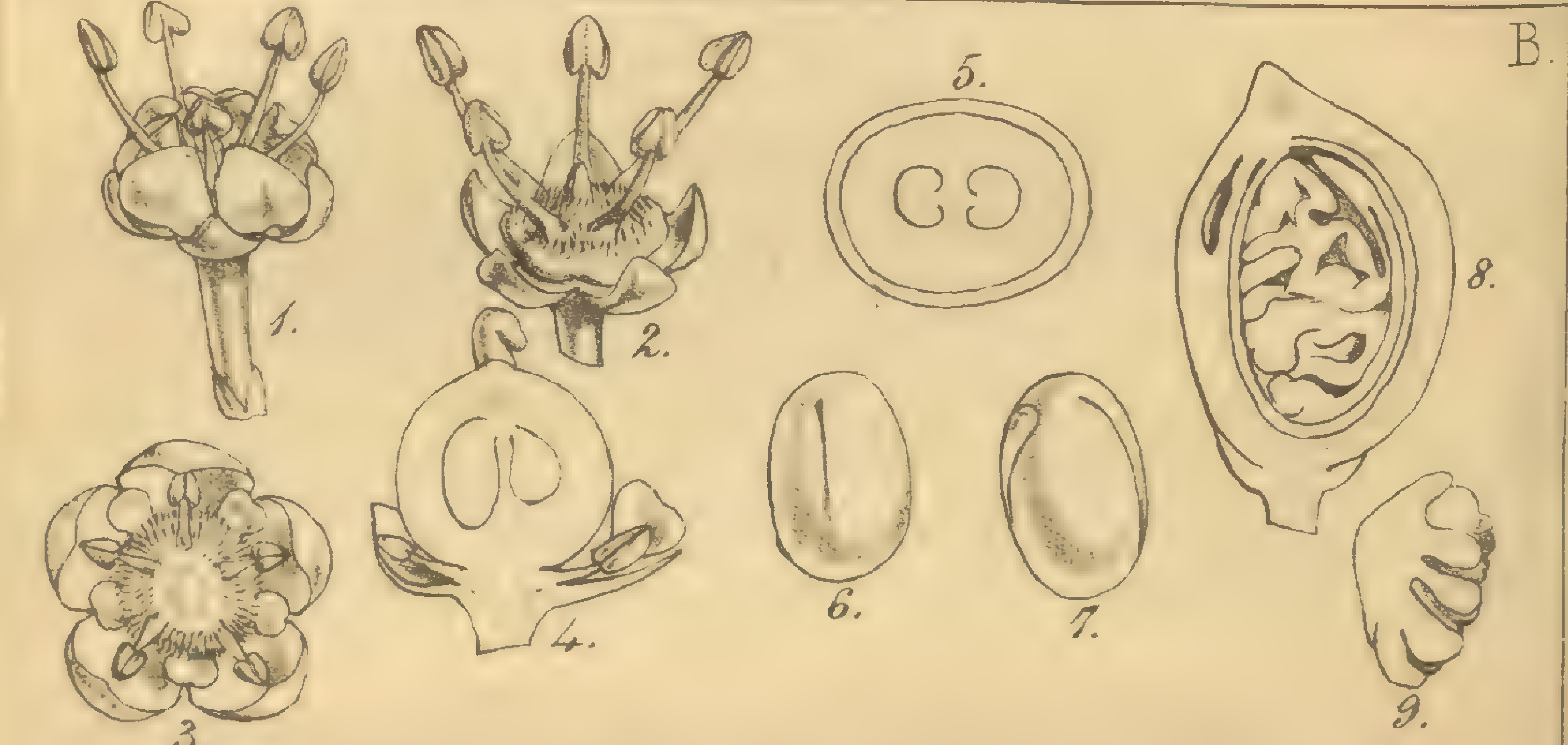
This is an enumeration of the Fungi of Mr. Welwitsch's Portuguese Collection, which are placed in Mr. Pamplin's hands for disposal, and which is printed for distribution, we believe, to the subscribers. Besides the enumeration of the whole, Mr. Berkeley has given the characters of, and remarks upon, seven new species.

We are glad to take this opportunity of saying that this admirable Botanist and Collector (Mr. Welwitsch) has embarked for the Portuguese settlement of Angola, where he is engaged to superintend some extensive plantations; and where he will doubtless make many interesting botanical discoveries.

A.

Campnosperma Zeylanicum. *Thw.*

B.

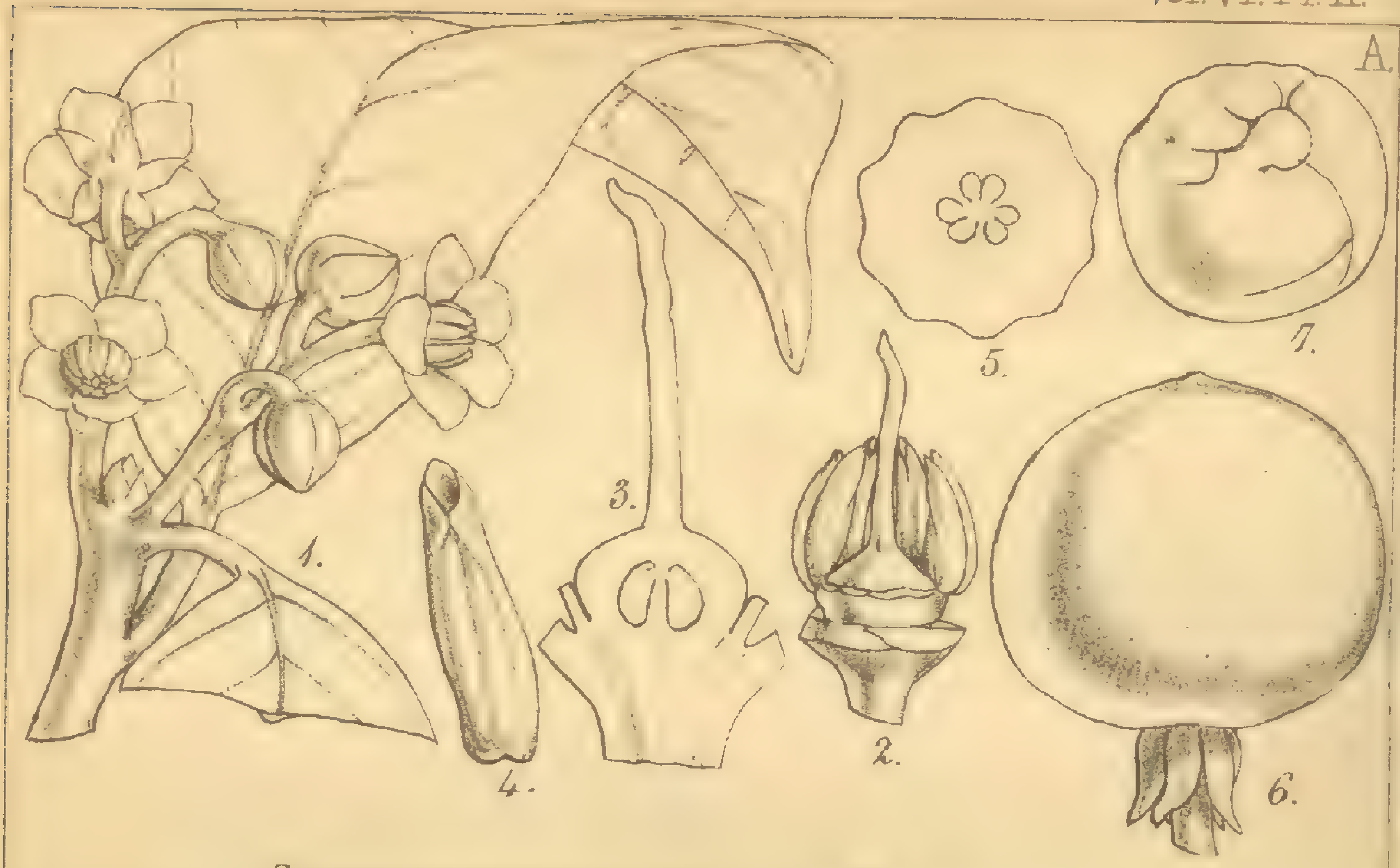


Pteridophyllum decipiens, *Thw.*

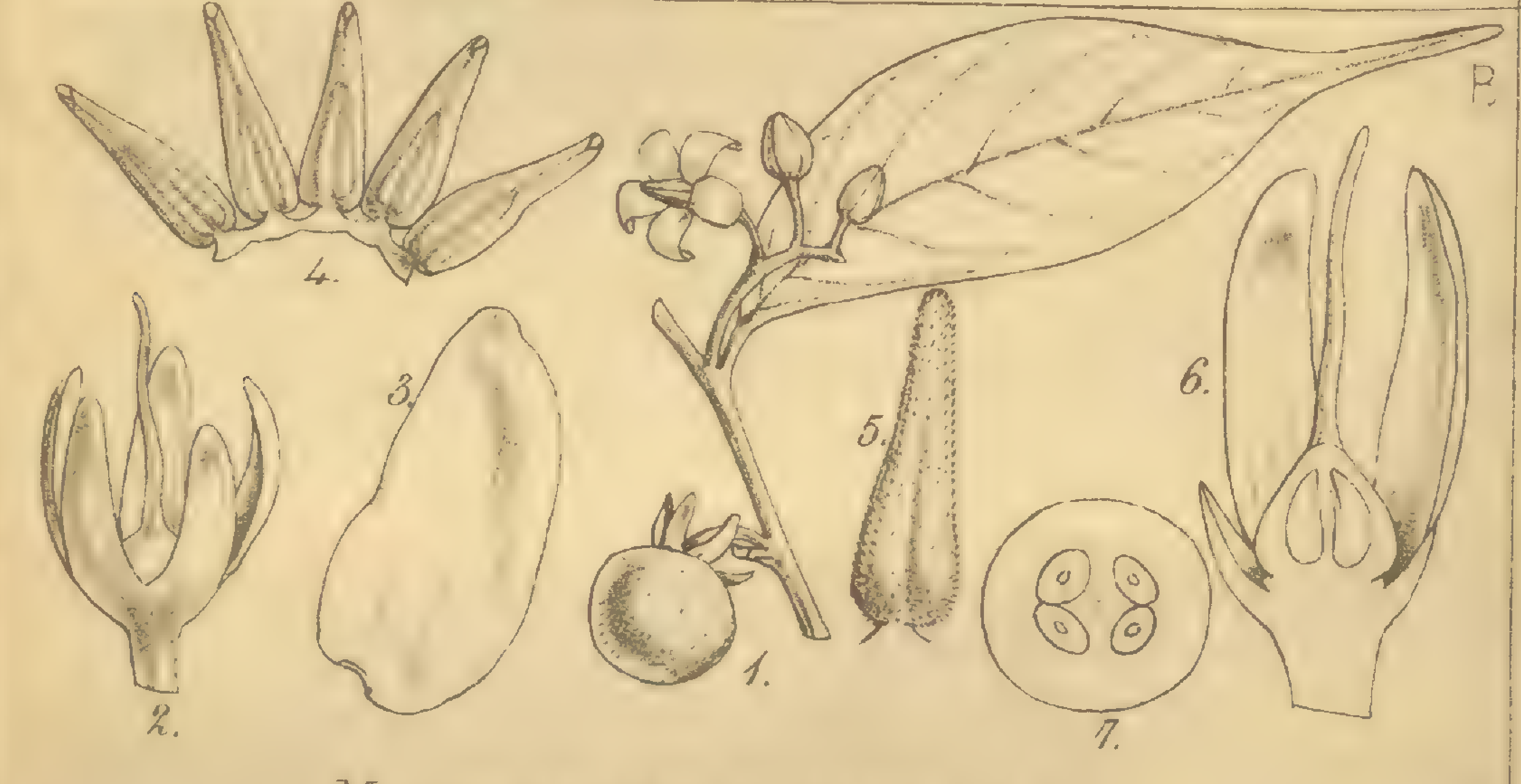
C.

Printed by F Reeve

Axinandra Zeylanica, *Thw.*



Stemonoporus Gardneri, *Thw.*



Monoporandra elegans, *Thw.*

H. De Alwis del. Fitch lith.

Printed by F. Reeve.

Terpnophyllum Zeylanicum, *Thw.*

Description of some new Genera and Species of CEYLON PLANTS; *by* G. H. K. THWAITES, ESQ., *Superintendent of the Royal Botanic Garden at Peradenia.*

(TAB. I., II.)

NOV. GEN. CAMPNOSPERMA, *Thw.* Nat. Ord. Anacardiaceæ.

Char. Gen. Flores hermaphroditi. *Calyx* 3-partitus, persistens, laciniis erectis triangularibus. *Petala* 3, sub disco urceolato imo calycis adnato inserta, orbiculato-triangularia, erecta. *Stamina* 6, cum petalis inserta; *filamenta* basi dilatata, incurvata; *antheræ* ovatæ, adnatæ, introrsæ, longitudinaliter dehiscentes. *Ovarium* liberum, sessile, ovatum, uniloculare; *ovulum* solitarium, ex apice loculi pendulum, anatropum, arcuatum; *stylus* subnullus; *stigma* dilatatum, discoideum, irregulariter lobatum. *Drupa* carnosa, ovata, putamine osseo, cavitatis dimidio superiore diaphragmate osseo (putaminis processu?) diviso. *Semen* pendulum, drupæ cavitati conforme, arcuatum, exalbuminosum; *cotyledones* planæ, oblongæ, arcuatæ; *radicula* brevi, supera.—Arbor 30–40-*pedalis, ramosa;* ramulis *teretibus, rufescentibus;* foliis *alternis, simplicibus, integerrimis, ovato-lanceolatis, basi gradatim angustatis, breve petiolatis, penniveniis, reticulatis, subtus minute rufo-punctatis, junioribus ferrugineis, lentiginosis;* inflorescentia *simplicissime paniculata, florum numero mediocri;* floribus *minutis, 2 lin. longis,* 1-*bracteatis.*

Campnosperma *Zeylanicum,* Thw., C.P. No. 246, in Herbario Peradeniensi. (TAB. I. A.)

HAB. Not uncommon about the banks of rivers at Natuapoora, and the lower part of the Saffragam district, Ceylon.

PLATE I. A. Fig. 1 .Branch of *Campnosperma Zeylanicum.* 2. Flower. 3. The same, with the petals removed. 4. Longitudinal section of ovary, with calyx and glandular disc. 5. Ripe seed. 6. Longitudinal section of the same:—*all but fig.* 1 *and* 5 *magnified.*

NOV. GEN. PTERIDOPHYLLUM, *Thw.* Nat. Ord. Anacardiaceæ.

Char. Gen. Flores polygami, monoici. *Calyx* 5-partitus, persistens, laciniis æqualibus, æstivatione imbricatis. *Corollæ petala* 5, sub disco lanato inserta, sessilia, æqualia, concava, æstivatione imbricata. *Stamina* 5, disco intus inserta, ovarium cingentia, æqualia, petalis alterna; *filamenta* subulata, libera; *antheræ* introrsæ, sagittatæ, dorso

affixæ, versatiles, longitudinaliter dehiscentes, in floribus fœmineis effœtæ. *Ovarium* unicum, liberum, sessile, globosum, biloculare, in floribus masculis effœtum. *Ovula* in loculis solitaria, prope apicem appensa, anatropa. *Stylus* simplex, curvatus. *Stigma* simplex vel sub-bilobum. *Drupa* carnosa, putamine membranaceo, sæpissime monosperma. *Semen* inversum, testa membranacea. *Embryonis* exalbuminosi cotyledones foliaceæ, plicatæ; radicula dorsalis, versus hilum directa et eidem fere attingens.—Arbor Indica *et* Zeylanica; ramulis *angulatis, sublævibus*; foliis *alternis, coriaceis, lævibus, subpari-pinnatis, foliolis* 12 *vel supra, lineari-oblongis, acutis vel sæpe retusis, ad basin angustatis, articulatis, penniveniis*, venis *parallelis, approximatis;* inflorescentia *paniculata;* paniculis *ramosis, multifloris, folia non æquantibus;* floribus *parvis, albis;* pedicellis *bracteatis*, bracteis *minutis.*

Pteridophyllum *decipiens*, Thw.—Rhus decipiens, *Wight et Arn. Prod. v.* 1. 172. *R. Wight, Illust. v.* 1. *tab.* 75.—C.P. No. 536, in Herbario Peradeniensi. (Tab. I. B.)

Hab. This is a very ornamental evergreen tree, and occurs in some abundance in the Ceylon forests, up to an elevation of 3000 feet; its wood is very hard. The ripe fruit is a favourite food of numerous frugivorous birds. The Cinghalese name of the tree is *Pehimbia.*

There cannot be a doubt of the propriety of removing the above plant from the genus *Rhus*, from which it differs in many important particulars, as a comparison of the generic characters will show.

Plate I. B. Fig. 1. Male flower of *Pteridophyllum decipiens.* 2. The same, with the petals removed. 3. Female flower with the ovary removed, to show the stamens, glandular disc, and small petals. 4. The same, cut longitudinally, to show the insertion of the stamens. 5. Transverse section of ovary. 6. Longitudinal section of ripe fruit. 7, 8. Ripe seeds, showing α, the hilum, and β, position of radicle. 9. Embryo.

Nov. Gen. Axinandra, *Thw.* Nat. Ord. Lythrarieæ.
Tribe Lagerstrœmieæ.

Char. Gen. Calyx persistens, tubo campanulato, limbi 5-partiti lobis triangularibus, æstivatione valvatis. *Corollæ petala* 5, summo calycis tubo inserta, ejusdem laciniis alterna, in cupolam deciduam connata. *Stamina* 10, subæqualia, serie duplici, dolabriformia, 5 externa

summo calycis tubo inserta, petalis alterna; 5 interna infra calycis marginem affixa. *Filamenta* brevia, dilatata, æstivatione inflexa. *Antheræ* adnatæ, dorso affixæ, introrsæ, longitudinaliter dehiscentes, connectivo postice valde producto, quadrato. *Ovarium* calycis tubo adnatum, 6-loculare, loculis monospermis. *Ovula* erecta, anatropa. *Stylus* brevissimus, cylindricus. *Stigma* simplex. *Capsula* 6-locularis, lignosa, loculicide 2–6-valvis (sæpissime 3-valvis). *Semina* erecta, oblonga, compressa, testa membranacea, margine superiore in alam membranaceam producta, umbilico basilari. *Embryonis* exalbuminosi cotyledones oblongæ, sagittatæ; *radicula* umbilicum attingens. —Arbor *ingens, ramosa;* ramulis *tetragonis (sub nodis dilatatis alatis);* foliis *oppositis, breve petiolatis, ovato-lanceolatis, integerrimis, glabris,* $4\frac{1}{2}$ *poll. longis,* 2 *poll. latis;* venatione *pennata,* venis secondariis *vena intramarginali anastomosantibus;* inflorescentia *racemosa;* racemis 1–2 *axillaribus, simplicibus,* 12–20-*floris;* floribus *parvis,* 2–3 *lin. longis, albis, breve pedicellatis;* pedicellis *unifloris* 3-*bracteatis;* bracteis *linearibus, scabris, marginibus involutis, pedicellum æquantibus.*

Axinandra *Zeylanica,* Thw., C.P. No. 2668, in Herbario Peradeniensi. (Tab. I. C.)

Hab. A large, handsome tree, from 50 to 60 feet in height, and which appears to be rare, as I have met with it but in one spot, in the Ambagamowa district, at an elevation of about 1500 feet.

Plate I. C. Fig. 1. Branch of *Axinandra Zeylanica.* 2. Portion of raceme. 3. Expanded flower, the petals having fallen. 4. One of the inner series of stamina. 5. Longitudinal section of ovary and calyx. 6. Transverse section of the same. 7. Ovule. 8. Old capsule. 9. Seed. 10. Embryo.

Nov. Gen. I. Stemonoporus, Thw. Nat. Ord. Dipterocarpeæ.

Char. Gen. Calyx 5-partitus, laciniis æqualibus; fructiferis vix auctis. *Corollæ petala* 5, æqualia, æstivatione convolutiva. *Stamina* 15, biseriata (5 interna, 10 externa), monadelpha; *filamenta* in annulum brevem, ovarium cingentem, coalita; *antheræ* oblongæ, introrsæ, singulæ poro terminali dehiscentes, connectivo non producto. *Ovarium* 3-loculare; *loculis* bi-ovulatis; *ovula* ex apice anguli centralis collateraliter pendula, anatropa. *Stylus* filiformis, simplex. *Stigma* simplex. *Fructus* sphæricus, calyce reflexo suffultus, coriaceus,

abortu unilocularis, monospermus, irregulariter dehiscens ($\frac{3}{4}$–1 poll. diametro). *Semen* testa membranacea; *embryonis* exalbuminosi cotyledones crassiusculæ, plicato-convolutæ. — Arbores *Zeylanicæ;* foliis *petiolatis, alternis, glabris, penniveniis, oblongis, integerrimis, rigidis, venosis, petiolis cylindricis;* stipulis *minutissimis;* floribus *prope apices ramulorum sitis, paniculatis, racemosis vel subsolitariis, albidis vel flavescentibus,* 5–7 *lin. latis;* paniculis *axillaribus.*

1. Stemonoporus *Gardneri*, Thw.; foliis oblongo-lanceolatis acuminatis basi rotundatis 3$\frac{1}{2}$–4 poll. longis $\frac{1}{2}$–2 poll. latis, petiolis 1 poll. longis, floribus paniculatis, paniculis plus minusve elongatis, 4–12-floris, pedicellis 3–4 lin. longis decurvatis. (TAB. II. A.)

HAB. A large forest-tree; abundant near Adam's Peak, at an elevation of about 5000 feet. Dr. Gardner found it near Rambodde. It flowers in February. C.P. No. 1920, in Herbario Peradeniensi.

PLATE II. A. Fig. 1. Flowering branch of *Stemonoporus Gardneri*, Thw. 2. Flower with the calyx, corolla, and portion of the stamens removed. 3. Stamen. 4. Longitudinal section of ovary. 5. Transverse section of ovary. 6. Ripe fruit. 7. Embryo:—*fig.* 4 *to* 7 *inclusive, more or less magnified.*

2. Stemonoporus *affinis*, Thw.; foliis oblongo-lanceolatis acuminatis basi rotundatis 3–4 poll. longis 2–2$\frac{1}{2}$ poll. latis, petiolis 8 lin. longis, floribus subsolitariis, pedunculis brevibus.—C.P. No. 2430, in Herbario Peradeniensi.

HAB. Found sparingly in the Hunasgiria district, at an elevation of about 4000 feet.

Differing from the last, to which it bears much resemblance, by its subsolitary, not panicled flowers. The leaves of this species are also less rigid, and the divisions of the calyx are narrower, than in *S. Gardneri.*

3. Stemonoporus *lanceolatus*, Thw.; foliis lanceolatis acuminatis basi angustatis supra minute venulosis 4–8 poll. longis 1$\frac{3}{4}$–2$\frac{1}{2}$ poll. latis, petiolis 6 lin. longis, floribus paucis subsolitariis, pedunculis brevissimis, calycis segmentis lineari-lanceolatis. C.P. No. 2658, in Herbario Peradeniensi.

HAB. A small tree, occurring in damp, shady forests near Ratuapoora, at no great elevation.

4. Stemonoporus *oblongifolius*, Thw.; foliis oblongis prope apicem angustatis obtusis basi rotundatis 4–6$\frac{1}{2}$ poll. longis 1$\frac{3}{4}$–2$\frac{1}{2}$ poll. latis, petiolis 6 lin. longis, pedunculis 4 lin. longis 1–2-floris, pedicellis

2–3 lin. longis, calycis segmentis ovato-oblongis.—No. 2646, in Herbario Peradeniensi.

HAB. A large tree, occurring in the Ambagamowa forests, at an elevation of about 4000 feet. In fruit in December.

5. Stemonoporus *rigidus*, Thw.; foliis rigidissimis oblongis obtusis basi subrotundatis aliquando cuneatis $3\frac{1}{2}$–$5\frac{1}{2}$ poll. longis $1\frac{1}{2}$–$2\frac{1}{4}$ poll. latis, petiolis 6 lin. longis, pedunculis brevissimis 1–3-floris, pedicellis 2 lin. longis, calycis segmentis ovato-oblongis obtusis.—C.P. No. 2645, in Herbario Peradeniensi.

HAB. Occurs sparingly in the Ambagamowa district; flowering in December.

This bears some resemblance to *S. oblongifolius*, but the leaves are more rigid and more strongly veined; the primary veins are also more numerous and closer.

Nov. Gen. II. MONOPORANDRA, *Thw.* Nat. Ord. Dipterocarpeæ.

Char. Gen. Calyx 5-partitus, laciniis æqualibus; fructiferis vix auctis. *Corollæ* petala 5, æqualia, æstivatione convoluta. *Stamina* 5, 1-seriata, monadelpha; *filamenta* in annulum brevem ovarium cingentem coalita; *antheræ* oblongæ, introrsæ, singulæ poro terminali dehiscentes, connectivo non producto. *Ovarium* liberum, 2-loculare; loculis bi-ovulatis; *ovula* ex apice anguli centralis collateraliter pendula, hemianatropa. *Stylus* filiformis, simplex. *Stigma* simplex. *Fructus* ut in genere præcedente, sed dimidio minor.—Arbores Zeylanicæ, *mediocres;* foliis *alternis, integerrimis, rigidis, acuminatis;* floribus *axillaribus, paniculatis vel subsolitariis, flavescentibus,* 4–5 *lin. latis.*

1. Monoporandra *elegans*, Thw.; foliis lanceolatis longe acuminatis basi subrotundatis $2\frac{1}{2}$ poll. longis (acumine $\frac{1}{2}$ poll. longo) 1 poll. latis, venis primariis supra prominentibus, petiolis 4 lin. longis, calycis segmentis lanceolato-linearibus. (TAB. II. B.) C.P. No. 371, in Herbario Peradeniensi.

HAB. A moderate-sized tree, occurring in some abundance in the Saffragam district, at the base of Adam's Peak, at an elevation of about 2000 feet.

PLATE II. B. Fig. 1. Flowering branch of *Monoporandra elegans*, Thw. 2. One of the petals. 3. The five stamens. 4. Stamen, *more highly magnified.* 5. Longitudinal section of ovary. 6. Transverse section of ovary. 7. Fruit:—*all but fig.* 1 *and* 7 *magnified.*

2. Monoporandra *cordifolia*, Thw.; foliis cordatis acuminatis $2\frac{1}{2}$–3 poll. longis $1\frac{1}{4}$–2 poll. latis, venis primariis supra depressis subtus prominentibus, petiolis 6 lin. longis, calycis segmentis lanceolatis. C.P. No. 2647, in Herbario Peradeniensi.

HAB. Not uncommon in the Ambagamowa and Saffragam districts, at an elevation of about 3000 feet.

Nov. Gen. I. TERPNOPHYLLUM, *Thw.* Nat. Ord. Clusiaceæ. Tribe Garcinieæ.

Char. Gen. Flores dioici. *Calyx* ebracteolatus, 4-phyllus; foliolis subæqualibus, imbricatis, deciduis. *Corollæ petala* 4, hypogyna, calycis foliolis alterna, æstivatione imbricata.—MASC. *Stamina* plurima in discum mamillatum bilobatum (vel sub-4-lobatum) inter se et cum petalorum singulorum media carina coalita. *Disci* mamillæ antheriferæ. *Antheræ* in quaque mamilla 2, 3, vel 4, sæpissime 2; loculis horizontalibus, subimmersis. *Ovarii* rudimentum mamillæforme, minutum.—FŒM. *Stamina sterilia* circiter 18, squamæformia, triangularia, ovarii basin amplectentia. *Ovarium* liberum, biloculare. *Ovula* in loculis solitaria, amphitropa, in placenta disciformi subimmersa, foramine inferiore. *Stylus* brevissimus. *Stigma* peltatum, sublobatum. *Drupa* carnosa, balsamiflua, abortu 1-locularis, 1-sperma. *Semen* medio affixum, testa membranacea.

Terpnophyllum *Zeylanicum*, Thw. (TAB. II. C.) C.P. No. 2695, in Herbario Peradeniensi.

Arbor mediocris; *foliis* oppositis, integerrimis, lanceolatis, utrinque angustatis, penniveniis (venis primariis cum vena intramarginali anastomosantibus, vel potius earum apicibus venam intramarginalem formantibus), petiolatis, 3–4 poll. longis, 1–$1\frac{1}{4}$ poll. latis, junioribus jucunde rubris, petiolo 4 lin. longo; *floribus* axillaribus, fasciculatis vel subumbellatis, $3\frac{1}{2}$ lin. latis, flavescentibus; pedicellis 2 lin. longis.

This beautiful species appears to be rare, as it has only been met with in one locality in the Central Province, at an elevation of about 3000 feet. Not one of the several natives to whom I have shown specimens of the plant, has recognized it as previously seen and known.

PLATE II. C. Fig. 1. Flowering branch of *Terpnophyllum Zeylanicum.* 2. Male flower. 3. Female flower, with calyx and corolla removed. 4. Longitudinal section of ovary. 5. Transverse section of ovary. 6. Drupe:—*nat. size.* 7. Longitudinal section of drupe, showing the sin-

gle seed and abortive loculus. 8. Longitudinal section of seed :—*all but fig.* 6 *magnified.*

Gen. II. Garcinia.

1. Garcinia *echinocarpa*, Thw.—C.P. No. 335, in Herbario Peradeniensi.

Arbor ingens, 40–50-pedalis; *foliis* integerrimis, coriaceis, oblongis, breve acuminatis vel retusis, basi parcę angustatis, 2½–5 poll. longis, 1½–3 poll. latis, penniveniis; venis primariis 1–1½ lin. distantibus, folii marginem fere attingentibus; *petiolo* 5–8 lin. longo, supra sulcato, rufescente. *Flores* dioici, ad ramulorum apices aggregati, sessiles, pallide flavescentes. *Calycis* foliola crassa, concava. *Petala* oblonga. —Masc. *Stamina* filamentis in discum tetragonum infra coalitis, supra liberis; antheris subquadratis, rufescentibus. *Ovarii* rudimentum sæpissime immersum.—Fœm. *Stamina* sterilia basi una serie coalita, supra libera, ovarium cingentia. *Ovarium* liberum, squamis carnosis numerosis imbricatis tectum; *stylo* brevi; *stigmate* peltato, irregulariter lobato, lobis tuberculatis, rufis. *Drupa* subsphærica, echinulato-muricata, 1–3-sperma, 1–1½ poll. longa. *Semina* oblonga; testa coriacéa, rufo-brunnea.

This species is well distinguished by its scaly ovarium, these scales subsequently becoming the echinulations of the ripe drupe. It is very abundant in the central province of Ceylon, at elevations of from 2000 to 5000 feet. There is a considerable difference in the size and texture of the leaves, according to the elevation at which the plant occurs, or degree of moisture of the soil, though the leaves on an individual tree are usually very uniform in character. The native name of the tree is *Madol*, or *Madol-gaha.*

About the structure of the embryo in the genera *Garcinia*, *Stalagmitis*, *Gambogia*, and *Terpnophyllum*, I have been unable yet to satisfy myself. A section of the seed in one direction shows an apparently homogeneous substance, with a small defined circular space in the middle, of a slightly different colour: a section of the seed at right angles to this exhibits an equally defined linear mark. Unless it had been stated to the contrary, I should have considered the seed as consisting of a cylindrical embryo, lying in the midst of a copious albumen. I have not been able to detach the cylindrical body from the surrounding mass, to which it firmly adheres. A careful examination of the seed,

in different stages of germination, will probably clear up this difficulty, and I shall keep my attention directed to it.

An apparently anomalous condition of the seed of a species of *Calophyllum* occurred to my observation a short time ago. Instead of finding, as is usual in this genus, an exalbuminous embryo, with large, thick, oily, colourless cotyledons, I found a moderate-sized, well-developed, deep green embryo, immersed in an abundant albumen. Whether this be the usual condition of the seed in this species (C.P. No. 2446), I must ascertain by getting specimens, in the proper season, from other trees of the same kind.

(*To be continued.*)

FLORULA HONGKONGENSIS: *an Enumeration of the Plants collected in the Island of Hongkong, by* Major J. G. Champion, 95*th Reg.*; *the determinations revised and the new species described by* GEORGE BENTHAM, ESQ.

(*Continued from p.* 9.)

Genera allied to EUPHORBIACEÆ*.

1. Scepa *Chinensis*, Champ., sp. n.; foliis oblongis apice subdentatis coriaceis glabris v. subtus ad costam pilosis, amentis masculis brevibus densis, perigonii laciniis longe rufo-ciliatis, staminibus sæpius 2.—*Arbor*, ramulis parce hirtellis. *Folia* in specimine bipollicaria, semipollicem lata, dentibus paucis brevibus obtusis, petiolo 3 lin. longo, sed verosimiliter sæpe majora sunt et latiora. *Stipulas* jam delapsas non vidi. *Amenta* mascula (vix perfecte evoluta) semipollicaria, fasciculata, fere a basi dense imbricata. *Squamæ* latæ, obtusiusculæ, leviter ciliato-puberulæ, *flores* fovent 3–5 sessiles, quorum laterales interdum minores 2–3-meri et monandri, plerique tamen 4-meri diandrique. *Perigonii* laciniæ concavæ, parum inæquales, ciliis marginalibus longis rufisque. *Ovarii* vestigium nullum vidi. *Spica* fœminea, longitudine amenti masculi, obtecta est villis longis rufis squamisque iis marium similibus, in specimine suppetente ultra medium sterilis, apice fructifera, florentem non vidi. *Fructus* in specimine 5, ovoidei, acuminati, basi in stipitem brevem attenuati, villis

* See Tulasne's excellent monograph of *Antidesmeæ*, in the 'Annales des Sciences Naturelles,' Ser. 3, vol. xv. p. 180, where he has shown good grounds for associating *Scepaceæ* and *Antidesmeæ* with *Euphorbiaceæ*, if not for uniting them in one family.

paucis rufis onusti, et basi perigonii laciniis 4 ovatis ciliatis persistentibus fulti. *Styli* 2, profunde bipartiti, lobis crassis recurvis superne fimbriato-stigmatosis. *Pericarpium* tenuiter subcarnosum, demum induratum. *Endocarpium* tenuiter crustaceum, in coccos 2 intus versus axin villosos divisum, altero vacuo altero biovulato. *Semen* in specimine examinato unicum (ovulo altero persistente non aucto), ex apice axeos villosi pendulum, ovoideum, testa crustacea, albumine carnoso-subcartilagineo. *Cotyledones* magnæ, orbiculatæ. *Radicula* brevis, ad hilum spectans.

A common tree in the island. I regret not having seen the female flower, for in the fruit one cell or coccus seemed quite empty and pressed flat, the undeveloped ovule and the seed being collaterally attached in the other. I find no arillus in *Scepa*, unless the endocarp, which detaches readily from the pericarp, as in many *Euphorbiaceæ*, be considered as such. In this species it is, according to Major Champion, amber-coloured, with a bitter-sweet flavour.

2. Antidesma *bunius*, Spreng.—Tul. in Ann. Sc. Nat. Par. Ser. 3. vol. xv. p. 186.

Hongkong.

3. Antidesma *Japonicum*, Sieb. et Zucc. Fl. Jap. Fam. Nat. p. 88.

Happy Valley, where it is subarborescent. The species is exceedingly variable in the shape of its leaves. One female specimen in fruit is precisely similar to Siebold's, from Japan, communicated to me by Dr. Blume; it has oblong-lanceolate leaves, above 3 inches long; another, a male, has the leaves very much narrower, almost linear, but most of them have ovate or ovate-oblong leaves, from 1–2 inches in length. They all come near to the *A. diandrum*, but the leaves are smoother, almost shining, the racemes very much shorter, and more paniculate, the bracts acuminate and narrower, and the male flowers appear to be constantly triandrous, with a deeply 3-lobed calyx.

4. Antidesma *paniculatum*, Roxb.—Tul. l. c. p. 228.

West Point. A shrub.

URTICEÆ *et affines*.

1. Pouzolsia *hispida*, J. J. Benn. Pl. Jav. Rar. p. 66. var.? *glabrata*. —*Hyrtanandra Javanica*, Miq. Pl. Jungh. p. 25.?

Hongkong. There is only a small male specimen, which I am unable to determine accurately. Miquel, in establishing his genus *Hyrtanan-*

dra, does not appear to have been aware of Bennett's account of the genus *Pouzolsia*, where the same group is considered as a section of *Pouzolsia*, under Hamilton's name of *Memorialis*. It is characterized by the winged fruit, whilst Miquel's is founded on the peculiar shape of the male flowers. It does not appear certain however that the two characters coincide in all the species, and the whole genus is too natural a one to be divided.

2. Bœhmeria *nivea*, Gaud.—Hook. in Kew Journ. Bot. vol. iii. p. 315. t. 8.

Common in ravines. In most Chinese as well as cultivated specimens, the leaves are seldom so distinctly cordate as in Zollinger's Javanese specimens, although very differently shaped from those of *B. Puya*.

3. Morocarpus? *microcephalus*, sp. n.; dioica, foliis ovato-lanceolatis acuminatis serratis trinerviis hirtis concoloribus v. novellis subtus albis, florum masculorum glomerulis sessilibus trimeris, fœmineorum capitulis brevissime pedicellatis.—*Frutex?* ramulis numerosis subherbaceis appresse puberulis. *Stipulæ* anguste lanceolatæ, subulato-acutatæ, rufo-membranaceæ, 2–3 lin. longæ, basi intra petiolum brevissime connatæ, caducæ. *Folia* alterna, petiolata, 2–3 poll. longa, 6–12 lin. lata, grosse serrata, basi rotundata, supra scabro-puberula v. mox glabrata, subtus ad venas piloso-hirta, inter venas prima juventute plus minus tenuiter albo-lanata, lana tamen in folio adulto sæpissime evanida. *Flores* tam masculi quam fœminei secus ramos post folia delapsa glomerati. *Glomeruli masculi* sessiles 2–3 lin. diametro, 10–20-flori, bracteis 2 stipulæformibus lineari-subulatis suffulti. *Flores* intra bracteolas parvas sessiles, ante explicationem globosi, membranacei, apice pilis paucis hirsuti. *Perigonii* foliola concava. *Stamina* tria, exserta, in alabastro inflexa, antheris latis bilocularibus. *Ovarii* rudimentum lineari-conicum, villosum. *Capitula fœminea* in quoque glomerulo 3–5, brevissime pedicellata, glomerulo ipso sessili v. breviter pedunculato. *Capitula* singula vix lineam diametro, 6–10-flora, bracteis ovatis flore brevioribus involucrata. *Receptaculum* non carnosum. *Flores* intra bracteolas sessiles, minimi. *Perigonium* ovario arcte adnatum, apice minute tridentatum. *Stigma* sessile, pilis longis penicillatum.

Ravines of Victoria Peak, stinging when touched. These specimens are males only, but I have what appears to be precisely the same

species from Wallich's Nepaul collection, n. 9091 of his catalogue, both males and females, which have enabled me to complete the description. It agrees with Zuccarini's character of *Morocarpus* in the constantly trimerous male flowers, and in the structure of the females and of their stigmate, but the anther-cells do not appear to be distinctly enough divided to call the anther four-celled, and I have not seen the fruit to ascertain whether it becomes fleshy. Miquel's *Leucocnide*, from his character, agrees with *Morocarpus* in the stigmate and inflorescence, and in the apparent absence of perigon in the females; it has likewise some triandrous species. He considers however the bracts at the base of the ovary as representing the female perigon, whilst to me it appears, at least in our species, that the minute teeth at the summit indicate its adherence to the ovary. Miquel also describes the stipules as axillary and bipartite; but that is only another mode of expressing the connection of the two stipules at the base within the petioles.

4. A shrubby or arborescent *Urticacea*, from the Happy Valley woods, perfectly glabrous, with shining, coriaceous, alternate leaves, and corymbose, 5-merous male flowers; but, for want of the female, I am unable to determine the genus.

5. Sponia *argentea*, Planch. in Ann. Sc. Nat. Par. Ser. 3. vol. x. p. 323.

Hongkong.

6. Morus *alba*, Linn.

Cultivated in Hongkong.

7. Ficus (Urostigma) *nitida*, Thunb.—*Urostigma nitidum*, Miq. in Lond. Journ. Bot. vol. vi. p. 582.

A common Chinese tree-fig, found also in Hongkong by Major Champion, although no specimen was gathered. The genera established by Miquel appear to form very good sections, but are scarcely founded upon characters of sufficient importance, or are sufficiently natural, to justify the breaking up so very natural and distinct a genus as *Ficus*.

8. Ficus (Urostigma) *angustifolia*, Roxb.—*Urostigma nervosum*, Miq. in Lond. Journ. Bot. vol. vi. p. 585.

A shrub in the Happy Valley woods, agreeing precisely with Sillet specimens.

9. Ficus (Plagiostigma) *pyriformis*, Hook. et Arn.—Miq. in Lond. Journ. Bot. vol. vii. p. 437.

A shrub, always found in the beds of watercourses, where it is common, and in fruit at the time when *Azalea Indica* blows.

10. Ficus (Sycidium?) *variolosa*, Lindl.—Benth. in Lond. Journ. Bot. vol. i. p. 492.

Common in ravines. The leaves vary in length and breadth; they are usually of the size and with the venation of those of *F. pyriformis*, but the point is very short, broad and blunt. The peduncles are from 1 to 3 lines long, with three bracts at the apex. The receptacles I formerly described were very young; those on Captain Champion's specimens appear to be full grown, they are 4 or 5 lines in diameter, nearly globose, slightly umbonate, with a few scales at the mouth. The flowers are tribracteolate, the males few in number, near the mouth, stipitate and diandrous, the females numerous, sessile or stipitate, with a unilateral style, and an obliquely truncate or emarginate stigmate, nearly as in the section *Plagiostigma*. The perigons are 3-phyllous, and brown as well as the bracts.

9. Ficus (Sycidium?) *impressa*, Champ., sp. n.; fruticosa (prostrata?) ramosissima glabra, foliis (parvis) petiolatis ellipticis oblongisve obtusis integerrimis basi rotundatis penninerviis reticulato-venosissimis areolis subtus impresso-punctatis, receptaculis pedunculatis tribracteatis parvis globosis.—*Ramuli* fructiferi flexuosi, breves. *Folia* 1½ v. raro 2 poll. longa, 6–8 lin. lata, tenuiter coriacea, basi breviter 3–5-nervia, cæterum penninervia, nervis majoribus a costa divergentibus utrinque 6–8 intra marginem arcuato-confluentibus, rete venularum utrinque conspicua, areolis subtus sub lente eleganter punctis lineolisve curvulis impressis. *Pedunculi* subgemini, 1–2 lin. longi. *Receptacula* 3 lin. diametro, pilis minutis nonnisi sub lente conspicuis strigillosa. *Bracteolæ* et perigonia fusca. *Flores masculi* sub ore plurimi, diandri, tripartiti; *fœminei* numerosi, 3–4-partiti. *Stylus* lateralis, brevis, stigmate unilateraliter dilatato. Adest etiam ramulus sterilis repens? tenuis hirtellus, foliis iis ramorum fertilium similibus nisi brevioribus obtusioribus et basi inæqualiter cordatis.

Hongkong. The leaves are in size and shape not unlike those of *F. antithetophylla*, as figured in the London Journal of Botany, vol. vii. t. 5 B., but different in colour and surface, and the receptacles are not half the size. This and the preceding species have the globose receptacles of the section *Sycidium*, but the stigmate is rather that of *Plagiostigma*.

10. Ficus (Leiosycea) *Championi*, Benth., sp. n.; glaberrima, foliis petiolatis ellipticis v. oblongis obtuse acuminatis basi angustatis inte-

gerrimis coriaceis nitidis pallidis penninerviis reticulatis, receptaculis subgeminis pedunculatis globosis, pedicellis petiolum æquantibus sub apice bracteatis, floribus fœmineis ebracteatis, perigonio integro ovarium includente ore denticulato, stylo longo bicruri.—*Arbor* undique glaberrima, ramulis teretibus. *Stipulæ* vix linea longiores. *Folia* iis *F. vasculosæ* simillima, nisi petiolo rigidiore subdilatato; lamina 2–3 poll. longa, 1–1½ poll. lata, costa prominula venisque albidis, his anastomosantibus, primariis validioribus subparallelis intra marginem arcuato-confluentibus. *Pedunculi* axillares, semipollicares, tenues, bracteis a receptaculo lineam distantes. *Receptacula* fere 5 lin. diametro, exacte globosa v. obscure pyriformia, in sicco pallida et subflavicantia, intus sub ore squamis fuscis reflexis instructa. *Flores masculi* sub ore perpauci, unicum examinavi: hic breviter pedicellatus erat, bracteolis 2 in medio pedicello florem includentibus. *Perigonium* tripartitum, fusco-membranaceum. *Stamina* 2, subsessilia. *Flores fœminei* numerosissimi, pedicellati et subsessiles, ebracteati. *Perigonium* membranaceum, fuscum, subvesiculosum, ovarium arcte includens, ore obliquo minute dentato. *Stylus* lateralis, e perigonio longe exsertus, filiformis, sæpissime (an semper?) longe sed inæqualiter bicruris.

Woods of the Happy Valley. It so much resembles in appearance the *F. vasculosa*, Wall. (from Penang and Singapore) that I have some hesitation in considering it as distinct; yet the female perigon is very different, and such as has only been described in some species of *Covellia*. In my specimens of the true *F. vasculosa* I find it deeply divided into four or five lobes, as described by Miquel. The Singapore plant has also the petioles rather longer and more slender, and the receptacles smaller. But it remains to be ascertained how far these differences, even those in the flowers, are constant.

11. Ficus (Eriosycea) *hibiscifolia*, Champ., sp. n.; foliis aliis integris oblique cordiformibus, aliis palmatis lobis 3–5 longe lanceolatis dentatis, supra sparse subtus ad venas caule petiolisque fulvo-setosis, receptaculis globosis sessilibus setosis.—*Frutex*, ramulis teretibus crassiusculis. *Folia* dum integra, valde obliqua, fere *F. repentis*; quæ divisa sunt pleraque ea *Hibisci* cujusdam v. *Abelmoschi* simulant, lobis palmatis elongatis intermedio 4–5 poll. longo, semipollicem lato, lateralibus brevioribus: omnia utrinque viridia, subtus pallidiora, nec tomentosa. *Petioli* 6–10 lin. longi, dense setosi. *Stipulæ* parvæ, novellæ inter setas fere reconditæ, mox deciduæ. *Receptacula* quam

in *F. Roxburghii* minora, globosa nec urceolata, minus dense et rigidius setosa. *Flores masculi* sub ore plurimi, plerique breviter stipitati, perigonio fusco 3–4-partito. *Stamen* sæpius solitare, filamento brevi, anthera oblonga; adest interdum alterum minus v. subæquale. *Flores fœminei* numerosi, sessiles v. stipitati, perigonio fusco 4–5-phyllo, phyllis exterioribus nonnunquam basi connatis. *Stylus* lateralis brevis, apice truncatus, primum erectus, demum horizontaliter patens. Nec villi nec bracteæ intra receptaculum adsunt, nisi pro bracteis haberes squamas tripartitas hinc inde inter flores sitas, quæ mihi potius flores abortivos videntur.

Common in ravines. The entire and divided leaves are, as in all allied species, sometimes on the same branch, sometimes on different individuals. The species is near *F. Roxburghii* on the one hand, and *F. hirta* on the other, but in many points very distinct from both.

12. Ficus (Eriosycea) *hirta*, Vahl.—Miq. in Lond. Journ. Bot. vol. vii. p. 456.

Hongkong.

There are likewise specimens of two species, apparently of *Ficus*, and both very different from any of the foregoing, but not being in fructification I am unable to determine them.

(*To be continued.*)

Report of a JOURNEY OF DISCOVERY *into the Interior of* WESTERN AUSTRALIA, *between 8th September*, 1848, *and 3rd February*, 1849; *by* J. S. ROE, ESQ., Surveyor-General.

(*Continued from p.* 48.)

Messrs. Ridley and Gregory rejoined us soon afterwards, having traced the salt lakes and their connecting channels downwards, to the one I had passed near, and found the country about them scrubby and worthless. Ascending Mount Madden, we found it a mass of solid red granite half a mile in length, and from its summit caught a view of East Mount Barren, bearing N. 172° 15′ E., nearly 50 miles distant, and again saw an intermediate range, apparently granite, which we had first observed in the morning. Its summit was now 15 miles distant in the S.E., and received the name of Mount Short, in honour of the excellent Bishop of South and Western Australia, who was expected at that time to be making his first pastoral visit to Perth. The country

around our station did not present a very encouraging appearance, the principal objects visible being sand-plains and thickets. The latitude of our camp was 33° 18′ 14″ S. On the 30th we pushed on to the N.E. 12 miles, over sand-plains and through much close thicket, including the stubborn burnt sticks of last year, 6 to 8 feet high, which much impeded our progress, and tore our clothes and packs. After searching many clumps of trees in vain, we at length found good rain-water and excellent grass among some burnt thicket, and encamped for the night.

Towards sunset of next day, after a fatiguing march of 23 miles through much thick country, partially wooded, we were again greatly favoured by coming most opportunely to a small shallow lake, the water in which, although highly coloured by the clay bed, was quite fresh; a little grass being scattered along the margin, we encamped for the night; the latitude by two stars 32° 55′ 20″ S. On quitting this lake, we entered immediately on a low level bed connected with it and trending to the eastward, about 600 yards in width, its well-defined banks being evidently waterworn, and flanked by thickets and dense shrubs. Our hopes of a river were however disappointed, for at the end of a mile the unimportance of this channel was evident, and we quitted it, while it took a S.E. and S. direction towards some extensive salt lakes, which we afterwards saw within twenty miles of the spot. Red and white sandstone cliffs, 15 feet in height, were here seen and examined, but no dip or inclination could be perceived in them, nor did they again appear as we proceeded N.E. Our distance at this time of eighty miles from the sea-coast, with a very intricate country intervening, would have rendered coal itself of little value, had that mineral appeared. On extricating ourselves from the thick country in this neighbourhood, and rising the open sand-plains beyond, we obtained the first glimpse of a lofty, bare, granite peak, 45 miles to the eastward, appearing over the intervening scrubby, wooded land, like the top of a huge sugar-loaf. A range of wooded hills of less elevation was also seen 25 miles in the N.E., and to them we first bent our way, as lying nearer our intended route; but the further we advanced, the worse became the country: the scrubs and thickets were more dense, the sandy soil more stony, appearances of grass less promising, and, after a fatiguing march of 18 miles, there was nothing better for our horses than coarse rushes and scrub, without water.

Early the next day, November 2nd, we proceeded on our N.E. course, and in eight miles came upon an extensive series of salt lakes and broad shallow channels, at least $2\frac{1}{2}$ miles in width, studded with many low rushy islands, and winding towards the hills we had seen the day before in the N.E. On one of these islands I halted our hungry horses for half an hour, to give them the benefit of some grass there, which, although dry, was very acceptable, and we plied our spade in vain in the most likely places around for fresh water; all however was salt,—the whole country for several miles seemed one extensive salt basin, or low depressed plain, and to afford no chance of our finding in it the article we stood so much in need of. As the day advanced I quitted this salt region, and on keeping more easterly came on good grass in several situations, but could not halt upon it for want of water; our last chance was the range of hills for which we had been steering: one of these we accordingly ascended, passed several channels quite dry, and were greatly disappointed, on reaching the summit, after sunset, to find it a collection of loose quartz and whinstone, instead of granite sheets retaining water. Forcing our way at once towards a deep valley beyond, the darkness and almost impracticable thicket soon obliged us to halt, and we tied our horses up short in a small clear space, without a blade or drop of any kind to give them; we were ourselves much better off, having a pint of water each, the last remains of our scanty stock. Markab on the meridian showed the latitude of this bivouac to be 32° 37′ 11″ S., or about 90 miles from the nearest part of the coast to the southward. Being now fairly within the Range, we could perceive it consisted of a succession of steep narrow ridges, of unequal elevation, covered densely with thickets and small timber, and yielding no grass. The soil was coloured a deep red by the ironstone at the surface, but the principal rock in view was whinstone, with fragments of quartz. This description seemed to apply to the whole of the Range, which apparently extended N.W. and S.E. about 6 miles, with a width of 3 or 4; but our view was very much confined by the thickness of the wood, and I had to regret being unable to catch even a slight glance at the country we had passed over, as the setting sun was gleaming like burnished gold upon some open waters to the westward of our recent route, and would probably have pointed out an extensive continuation of the salt-lakes we had encountered during the day. In remembrance of an excellent officer, under whom I had formerly served

in the navy, I named this the Bremer Range, and its highest hill Mount Gordon.

Our horses having now been two days without water, and eating but sparingly for want of it, I became anxious to obtain a supply for them, and fortunately succeeded next morning, by digging in a small watercourse which we had followed down to the eastward. Here their pressing thirst was in a slight degree alleviated by half a bucket apiece of a red liquid, which was nevertheless fresh; and before the heat of the day came on we fortunately found an abundant supply of good water, in small pools in the midst of thickets and scrub, where little expected. The rush of the poor horses to it was so sudden and uncontrollable, that they were all in the midst of the pool in an instant, and two of them carrying heavy loads were with difficulty unloaded and got out again. By this time we had passed to the south side of the Range, and found a continuation of the fresh pools in a watercourse which descended from its S.E. slopes; there was however a total absence of grass at this time, although there was reason to believe some good grass had covered the hill-sides previous to the last fires, which had swept all minor vegetation away, and left standing only that close thicket and scrub which we heartily wished had shared the same fate.

Food for our half-famished horses being now the first consideration, and there appearing little prospect of obtaining it on a more northerly route, or of procuring fresh water in the great salt valley to the south, I steered E.S.E., across tolerably open sand-plains, towards the high granite peak we had seen on the 1st, which was 28 miles distant in the S.E. Anxiously did we watch the progress we made towards the desired haven, not doubting its being able to afford us the means of giving the party a couple of days' rest; for all the horses, and two in particular, were sadly weak. All our anxiety and exertions however could not accomplish our wishes: the famished and exhausted animals, after a fatiguing journey of nearly twenty-four miles, to sunset, were unable to proceed any further up a continued ascent, and we were compelled once more to halt them for the night amidst coarse rushes and scrub, and without any water, their existence appearing to depend on our finding both water and grass on the morrow.

Algeiub, on the meridian, gave the latitude 32° 52′ 43″ S., and our distance from the granite-peak was still three long up-hill miles.

Commencing their ascent early next morning, the hill itself was

eventually reached, but all search for the means of keeping our cattle alive was for a time fruitless. Both grass and water were however found on the northern side, and there the party were encamped in the afternoon. I found it absolutely necessary to remain here a few days for the recovery of the horses, several of whom were so weak, wearied, and half-starved, as to be scarcely able to stagger along with their loads, and could scarcely be got on their legs again after falling. This respite also enabled us to examine and dry the provisions and stores, repair saddlery and clothes, and put in order our saddle-bags, which the recent thickets had almost reduced to shreds. A short rest was also very acceptable to the whole party. This welcome retreat being at the most elevated and prominent mass of land we had hitherto discovered on our journey, I had the honour to name the whole the Fitz-Gerald Peaks, the highest being distinguished as Peak Charles, and another, of proportionate elevation, as Peak Eleanora. The former is about 1000 feet above the surrounding plains, and has some excellent grass on its eastern base. The view from this peak, although very extensive, was by no means cheering: in every direction lay spread out one vast sea of dark scrub and thicket, intersected by broad belts of salt-lakes and samphire-marshes, to the visible extent of thirty miles, and doubtless more, winding through a country apparently almost level; the only exceptions being the wooded range we had last quitted, thirty-five miles to the N.W., and another range of similar appearance, somewhat further off, in the N.E. quarter. To the latter I felt most desirous of proceeding next; but when I contemplated its apparent character through a telescope, and glanced over the intermediate country, a recollection that my horses had been five days without grass before they reached Peak Charles, forbade me to compromise their safety, and thereby to endanger the results of the expedition by making the attempt. Having therefore sufficiently recruited them all, with only one exception, and refitted our shattered equipments, we launched out once more, on the morning of the 9th of November, into the frowning sea of scrub to the eastward, and soon came, as expected, upon country which had not belied its appearance.

It may be sufficient merely to add that, after struggling with this formidable country for three days, and by forced marches accomplishing a distance of fifty miles east from Peak Charles, the expedition became almost entangled in a very extensive series of salt lakes and

marshes, one false move amongst which would have proved its entire destruction. We had however fortunately come upon a patch of good grass for the horses in the midst of this universal waste, but they were sadly distressed for water, which had only once been met with since leaving Peak Charles. At this critical juncture it was found impossible to continue the exploration further eastward, until they could be recruited. For this purpose therefore I began next day to work my way to the south, in hopes of speedily emerging from the extensive salt country in which we had hitherto encountered so many obstacles. No improvement however took place for the next twelve miles and a half, at the end of which we looked out upon a country of much less elevation to the southward, and with great thankfulness welcomed the sight of a considerable elevation to the south-east, which formed the only break in the uniformly level horizon. It is scarcely necessary to say that we instinctively turned immediately towards this promising relief; but as I looked across the intervening distance of apparently thirty miles, and at the same time contemplated the distress and exhaustion of our cattle, I confess the result appeared doubtful, and I turned over in my mind what articles could best be left behind. We had not proceeded on our south-east course more than eight miles, before the horse I had most cause to fear for knocked completely up, and was unable to move another step: as he had only previously carried an empty saddle, it was speedily removed to another, and to our great regret poor "Jack" was abandoned for the present, in the hope we might yet find both water and grass within reasonable distance, and be able to recover him. Three miles further on, another of my best horses (Ney) also gave in, completely beat; and the rest were in a most pitiable condition, for we had been totally unable to restrain them from rushing into the salt lakes as we passed near them, and from drinking part of their contents before discovering their briny quality. To avoid these lakes was impossible: the country being so thick, they were not seen until a few yards distant. As the sun was now near the horizon, and I was extremely unwilling to lose this second horse without some further effort for his recovery, the party were encamped on the spot, after a most trying day's journey of more than twenty-three miles, but once more without either grass or water. A kind Providence however, which had already relieved us in many a difficulty, again interposed in our behalf, and a light rain which fell for two hours

during the early part of the night, enabled us to collect with our tin plates, from the surrounding bushes, sufficient water to give the two most suffering horses a gallon and a half each, and the remainder a quart apiece. This proved a truly welcome and seasonable taste, after having been three days and nights without a drop of anything but brine. We were also enabled to replenish our own small stock in keg and teakettle, the notes of the latter sounding on such occasions far more melodious in our ears than those of the most celebrated *cantatrice* framed out of softer materials. This day we passed over, in latitude 33° 8′ S., longitude 121° 52′ E., the dry beds of several salt lakes, of the white and dark red sandstones belonging to the coal formation. They were very mottled, and confusedly mixed, and had numerous veins of very hard ironstone running through them, similar in appearance to sandstones which we afterwards saw in close connection with coal and shales.

Striking our light dungaree tents at three o'clock next morning (November 13th), we got away early on our south-eastern route, the horses appearing somewhat revived; but their frequent falling and stumbling betrayed their extreme weakness, and at the end of four miles Ney was again left behind, from utter inability to proceed. With many regrets he was here abandoned and we pushed on, the day becoming very warm and oppressive. Every obstacle was however finally overcome, and at three o'clock I had the satisfaction to encamp the party once more in a desirable spot, at the east end of the hill for which we had been steering, and to which I gave the name of Mount Ridley, after one of my present companions, to whom I felt greatly indebted for his prompt and valuable aid on all occasions which required it. Indeed the whole party were actuated by the best spirit, and I need not say it was fully taxed in meeting all their privations and difficulties. Next day Messrs. Ridley and Gregory, with the native Bob, brought Ney once more into camp, but in such an exhausted condition as to render another day's halt necessary for his partial recovery. I regretted this the more, as the grass around Mount Ridley was scanty and poor, and I hoped to obtain it of much better quality at some other hills of similar character which appeared at the distance of twenty-five to forty miles further eastward. From the summit of the mount, which is a huge mass of bare granite a quarter of a mile in length and about 700 feet above the surrounding plains, several hills

of similar description were visible to the southward and eastward, but in every other direction was spread out one illimitable sea of flowering scrub and thicket, with extensive chains of salt and samphire flats and lakes, too numerous to particularize, and bounded by a distant horizon as unbroken as that of the sea itself.

Much of our time was now taken up in attending to the horses' backs and sides, which were sadly galled by their saddles being mostly those of ponies, and consequently too small. The leather and canvas of their appointments were also bad, and required constant repairs, which were rapidly consuming the small quantity of materials we had taken with us for the purpose.

Having by the evening of the 15th completed all pressing repairs, and weeded our baggage of every article that could possibly be dispensed with, we again pushed forward to the eastward early next morning, Ney with only an empty saddle. His powers of endurance had however been over-estimated, for at the end of fifteen miles they again failed, and he could move no further. Giving him a portion of the water we carried, Messrs. Ridley and Gregory's offer to remain and bring him on after us was accepted, and I made for the nearest granite hill, which was then nine miles distant to the S.E., rising like all the others out of extensive level flats of salt lakes and thickets. With a star for our guide, we groped our way after dark through the thick brushwood, and finally reached the hill at nine o'clock, turning the tired horses loose to find the best feed they could. Water we had already passed through, in thick tea-tree swamps nearly up to their knees; and next morning an excellent spring-well was discovered at the eastern foot of the hill, amongst luxuriant grasses of the best quality. Thither we immediately removed, from the rocky unsheltered bivouac we had been compelled to take up for the previous night; and soon afterwards the absentees returned, having been unable to bring on Ney nearer than four miles. At noon the attempt was renewed, aided by our two water-kegs and a bag of good grass; but when night closed in the poor animal was still a quarter of a mile from the camp, utterly unable to move another step, and it was not until next morning that he could be brought in. As both grass and water were abundant at this limited spot, I determined on leaving him here to have a chance of recovering from his exhaustion, and of being called for again on our return homewards by a more southerly route. I could scarcely bring

myself to regret the delay of a day thus caused, as the horses were greatly benefited by being in such good quarters. Numerous repairs were again made to our torn saddle-bags, and I was afforded an opportunity of obtaining an extensive round of angles to a numerous assemblage of distant granite hills which covered the horizon between E. and S.W. The most interesting of these to us was the Russell Range, which now for the first time came in sight fifty miles to the eastward, in lofty and rugged outline, cheering us with a far-off prospect of the eastern limit of the country I had been instructed to examine. Although so near however, there was no mistaking the nature of the intervening country, which was desolate and cheerless in the extreme, presenting no more friendly granite hills at which we could hope to keep our horses alive, and even the misty range itself causing many a doubt in my mind as to the nature of so huge a mass of rock, rising abruptly out of a sea of scrub. The whole northern horizon between this range and Mount Ridley was unbroken by a single hill, to the distance of thirty to forty miles, and was covered with salt lakes and dense scrub on a gradual northerly ascent. Here, on the evening of the 17th, we viewed with peculiar interest from our elevated position of 400 feet above the surrounding plains, a lengthened exhibition of the mysterious southern lights, which, for upwards of an hour, darted or flashed upwards in rapid succession to the height of 20° above the horizon, through a reddish glare, which resembled the loom of an extensive distant conflagration, but was in all probability due to the extreme haziness of the atmosphere.

The huge mass of granite, 200 feet above our camp, which had thus so opportunely afforded a refuge to our favourite horse, having been named after him Mount Ney, we suspended his saddle on a tree, and once more started eastward into the formidable country before us, relying on a continuance of that aid and protection which had hitherto been so conspicuously extended towards us. Nor had we overrated the nature of the obstacles which now opposed our progress. At first we were flattered into hope by some relaxation in the density of the scrub; but as we persevered on our way towards a small granite hill, where I hoped to obtain grass and water, numerous salt lakes again obtruded their unwelcome presence, bound and joined together by thickets so close and densely matted together as frequently to call our axes into requisition before the horses could move on. This belt of

salt and scrub, five or six miles wide, which occupied the lowest part of a valley trending to E. by S. being passed, and a passage forced through the close thickets which covered the opposite ascent, our poor horses could do no more, and were gladly conducted at the end of fifteen miles and a half to their promised rest and feed. Here however not a blade of grass rewarded our minutest search, and only a few pints of water were lodged in holes in the rock. Some flags and coarse rushes occupied the place of better feed; and among them the horses were tethered to do their best, water being fortunately found by digging near the N.E. foot of the granite rock.

Quitting this inhospitable retreat as early as possible next morning (19th November), we again steered east through thicket and scrub, growing in light soil; and at the end of six and a half miles came suddenly upon a small low fire which had just been abandoned by some natives. The embers were under my feet before they were discovered, and the country was so thick I did not immediately perceive near them several long bark baskets, tied up at the extremities, and filled with honey-flowers, which the natives had been employed in collecting. Their retreat was so hasty they had even left behind two carved and well-greased "wommeras," used in discharging their spears; nor could they be induced, by the loud calls and invitations of our native, to return and give us an interview. We therefore placed some biscuit in their baskets, left everything as we found it, and proceeded on our way; Bob being divided in opinion that they would either have taken us for devils and would never venture near the spot again, or that they were concealed at the time within a very few yards of it. We had on several occasions reason to suppose that the natives were aware of our vicinity as we passed through the country, and were even watching our movements; but we saw none of them at this time, nor could we succeed on other occasions in effecting any interview, although we purposely passed over tracts of country in which their fires were burning. On such occasions we saw feet-marks on the sand of men, women, and children, though not of numerous tribes, and observed their signal smokes rise suddenly up within a mile and a half of us soon after we had passed.

Although the country still continued to be densely thicketed, it lost its general flat character, and gave us hopes of a change; for fresh water had lodged in no less than three places met with this day, showing

the more clayey nature of the soil,—the salt lakes seemed to have been left behind, and a gradual rise was perceptible in the undulations, which on their ridges had an outcrop of granite. A change for the worse appeared however in the scrubs, which became even more close than before, and contained considerable quantities of a broad-leaved stubborn *Eucalyptus*, that would not readily yield a passage. At sunset we encamped once more without grass or water, but our hungry horses consumed the bark off every stem and the top of every bush within their reach, some of them even eating the dry sticks under their feet.

(*To be continued.*)

Observations on a remarkable CYCADACEOUS PLANT *from Port Natal; by* MR. JOHN SMITH, F.L.S., Curator of the Royal Botanic Gardens, Kew.

Amongst a very interesting collection of living plants recently brought by Captain Garden from Natal, and presented to the Royal Gardens, are two stems of the remarkable plant described by Mr. Moore, at page 228 of the last volume of this Journal, under the provisional name of *Stangeria paradoxa;* so called in honour of "its enterprising discoverer," Dr. Stanger, who introduced a living plant of it to the Botanic Garden at Chelsea, and afforded Mr. Moore the opportunity of describing it. This plant early attracted my notice, principally on account of its fern-like appearance, its pinnate frond, and simple forked venation diverging from a true midrib, and bearing much resemblance to some species of *Lomaria* or *Danæa;* but its solid napiform stem, from the apex of which the frond was produced, with some other peculiarities of structure, gave sufficient proof that it did not belong to the *Filices.* But although its venation is totally different from the longitudinal nearly parallel venation that characterizes *Cycadaceæ,* yet I became convinced that it belonged to that Order. On making further inquiry respecting this plant, I was favoured by Dr. Balfour of Edinburgh with the examination of a specimen from Natal, labelled "*Lomaria eriopus,* Knz. in Linnæa, vol. xii. p. 152. Fructificationem detexi anno 1849, *W. Gueinzius,* Port Natal." This specimen consisted of a male cone, like that of a small *Zamia,* about five inches long and one broad; unfortunately it was not accompanied by any specimen of what Gueinzius would call the sterile frond

of *Lomaria eriopus*. It however appeared to me just such a cone as might, from analogy, be expected to be produced by a plant like that at Chelsea. In order to ascertain whether the specimens of fronds upon which Kunze founded his *Lomaria eriopus*, and of which, according to Gueinzius, the cone above described was the fructification, were the same as the Chelsea plant, I procured through the kindness of Mr. Moore a pinna, and forwarded it to Dr. Reichenbach of Leipzig, with a request that he would compare it with Kunze's specimens of *Lomaria eriopus*. In reply he informs me that they are identical, and further that Kunze's specimens have a Cycadeous structure.

From the above it appears that Mr. Moore is in error in giving the credit of the discovery of this plant to Dr. Stanger, he being only the introducer of it to this country, it having been detected many years ago by the Collector Gueinzius, and also by Drège, both of whom transmitted specimens of the fronds to Kunze, who from their appearance considered them as a species of *Lomaria*. The first referred them to *Lomaria coriacea* of Schrader*; but he afterwards corrects his previous statement†, and says that his specimens differ from *L. coriacea* in several points, especially in the stipes being woolly, and he accordingly designates it as a new species, under the name of *Lomaria eriopus* (not *lagopus*, as quoted by Mr. Moore). It is rather surprising that Kunze should have referred his specimens to *Lomaria*, as the circumstance of the stipes being woolly is quite sufficient to show that they had nothing to do with that genus.

Since I ascertained the above particulars, another male, and some fragments of a supposed female cone, have been exhibited at a meeting of the Linnean Society, and also several small plants which, with those brought by Capt. Garden, have afforded me a few more particulars, chiefly as regards its mode of vernation. In *Cycadaceæ* the vernation, as hitherto characterized, is straight; in *Zamia* and its allies the pinnæ are flat, and oppositely folded against each other; in *Cycas* the pinnæ are circinate. *Stangeria* differs from the general character of the Order, and also in the secondary character of the genus, in its fronds being inflexed in vernation; the upper portion of the frond, bearing the nascent pinnæ, being abruptly bent against the stipes, and on being developed from the axis of growth, the stipes gradually lengthens, and the upper inflexed part bearing the young pinnæ becomes straight. As in *Zamia*,

* Linnæa, vol. x. p. 506.

† Linnæa, vol. xiii. p. 152.

the pinnæ face each other, but instead of being flat, as in *Zamia*, each pinna is rolled up longitudinally; but their mode of unfolding I have yet to ascertain. It will thus be seen that *Stangeria* differs from all known *Cycads* by its inflexed and involute vernation, and in the veins of the pinnæ rising from a true midrib, the latter rendering untenable the character usually relied upon for distinguishing fossil *Filices* from fossil *Cycads*. In order to perfect the description of this plant, it will be requisite to watch the way in which the pinnæ unfold, and also to be furnished with a perfect female cone. To obtain the latter, we solicit the assistance of our correspondents at Natal.

BOTANICAL INFORMATION.

Pine-Leaf Fibre of Silesia and the Bahamas.

At p. 277 of our last volume will be found an account of a mode of extracting a useful fibre from the leaves of the common or "Scotch" Pine (*Pinus sylvestris*) in Silesia. A more full description, which we subjoin, of the manufacture in Silesia, appeared in the 'Nassau Guardian,' Bahamas, and seems to have led to the preparation of a similar fibre from another kind of Pine in the islands just mentioned. The account is as follows:—

"Near Breslau, in Silesia, is a domain called the 'Prairie of Humboldt:' there exist two establishments, as remarkable for their produce as for their united services to mankind. One is a manufactory which converts Pine-leaves into a sort of a cotton or wool; the other offers to invalids, as curative baths, the waters used in the manufacture of that vegetable wool. Both have been erected by M. de Pannewitz, inventor of a chemical process by means of which it is possible to extract from the long and slender leaves of the Pine a very filaceous substance, which he has named wood- (or Pine-) wool. It can be curled, felted, and woven.

"All the acicular leaves of the Pines, and of the *Coniferæ* in general, are composed of fibrillæ, extremely fine and tough, surrounded and held together by a resinous substance, under the form of a thin pellicle. When by decoction, and the use of certain chemical agents, the resinous

substance is dissolved, it is easy to separate the fibres, to wash them and free them from all foreign substances. According to the mode of preparation employed, the woolly (or fibrous) substance acquires a quality more or less fine, or remains in its coarse state; in the first instance it is used as wadding, in the second to stuff mattrasses. If this Pine has been preferred to other of our Pines, it is on account of the length of its leaves. It can be stripped of its foliage when quite young, without any injury; the operation takes place when it is still green. A man can gather 200lbs. of leaves a day.

"It was first advantageously substituted for cotton and wool in the manufacture of blankets. The hospital of Vienna bought 500, and after a trial of several years, has adopted them entirely. It has been remarked, among other advantages, that no kind of insects would lodge in the beds, and the aromatic odour was found agreeable and beneficial. These blankets have since been adopted by the Penitentiary of Vienna, the Charity Hospital, and the barracks of Breslau.

"Its cost is only one-third of that of horsehair; and the most experienced upholsterer, when the wool is employed in furniture, could not tell the one from the other. It can be spun and woven, and resembles the thread of hemp for strength, and it may be made into rugs and horse-blankets. . . . . . .

"In the preparation of this wool, an ethereal oil of a pleasant odour is produced. This oil is at first green: exposed to the rays of the sun, it assumes an orange-yellow tint; replaced in the shade, it resumes its former green colour; rectified, it becomes colourless. It differs from the essence of turpentine extracted from the same tree. It has been found efficient in rheumatism and gout, also as an anthelmintic in cutaneous diseases. Distilled, it is used in the preparation of lac of the finest kind. It burns in lamps like olive oil, and dissolves caoutchouc completely in a short time. Perfumers in Paris use it in large quantities. . . . . . .

"It is the liquid left by the decoction of the Pine-leaves, which has been so beneficial in the form of bath. The bath establishment is a flourishing one. . . . . . .

"The membranous substance obtained by filtration at the time of the washing of the fibres, is pressed in bricks, and dried; it is used as a combustible, and produces, from the resin it contains, a quantity of gas sufficient for the lighting of the factory. The production of a

thousand quintals of wool leaves a quantity of combustible matter equal in value to six cubic metres of Pine-wood."

For a knowledge of the preparation of a similar fibre from a West Indian Pine, namely of the Bahamas, I am indebted to His Grace the Duke of Newcastle, who, as Chief Secretary of State for the Colonies, did me honour to send me the following copy of a letter addressed to him by the Governor of Bahamas Islands, C. R. Nesbitt, Esq., together with samples of the fibre for the Museum of the Royal Gardens.

"Government House, Nassau, Bahamas,
"10th December, 1853.

"MY LORD DUKE,—I have the honour to enclose for your Grace's information, the copy of a Report made to me by the Surveyor-General of Lands, relative to the vast indigenous forests in this Colony, of that species of the '*Abies*' [Pinus?] commonly known as the '*Pitch Pine Fir*.'

"The Surveyor-General estimates these forests at not less than 200,000 acres in extent; these are however singularly limited to four Islands in the Colony, viz. Abaco, Andros Island, Grand Bahama, and New Providence. This Report was called for by me, in consequence of a specimen of the fibre obtained from the spines or leaves of this species of Fir-tree, deposited during the present year in the Nassau Museum; a larger portion of which fibre has been subsequently produced by the labour of prisoners, a specimen of which is herewith forwarded for your Grace's inspection.

"I trust your Grace will kindly pardon any irregularity in thus bringing under your notice a subject not of ordinary official routine. A severe hurricane that occurred about the 22nd ultimo has created much misery in the Colony, the lower orders, as is usually the case in such visitations, being the greatest sufferers. The sad event adds much to the previously entertained conviction, that the labouring class in this Colony suffer very much for the want of some additional staple, on which to employ their industry; and, hoping that a new resource may be found in the staple obtainable in these indigenous forests, I trust that in thus communicating with your Grace, as the head of the Colonial Department, on the subject, some advantage may accrue to the inhabitants of this Colony.

"I annex to this despatch a printed copy of a paper on the subject of the fibre of the Pine" (given above), "which appeared in the 'Nassau Guardian,' explanatory of its use at Vienna.

"When the art of obtaining it with the greatest facility and in the manner best adapted for use is fully known, and its value correctly ascertained, it may possibly eventually become an article of no inconsiderable export from this Colony, and, if only as a matter of reference hereafter, your Grace may possibly not deem this despatch superfluous.

"I have the honour to be, etc. etc.

"(Signed) C. R. NESBITT,

"Lieut. Governor.

"To His Grace the Duke of Newcastle, etc. etc."

I believe Botanists in general were not aware of the existence of any species of Pine in the Bahamas; but if the situation of the particular islands mentioned above as having "Pine barrens" of this vast extent, it will be seen that they are those most adjacent to, and not very distant from the mainland of Florida, where the *Pinus Australis* of Michaux (*Pinus palustris*, Willd.) grows in great abundance, the most southern Pine indeed of the United States. And from a careful inspection of the fibre sent, three long leaves may be traced arising from one sheath, as is the case in that species.

His Grace the Duke of Newcastle has most judiciously transmitted samples of this fibre to the Society of Arts, which has undertaken thoroughly to investigate the matter, and to communicate the result for the information of the Colonists.

Plants of Armenia.

Mons. Huet du Pavillon, a young botanist who had already collected a good deal in the Alps and is well acquainted with plants, made an excursion last summer into Armenia, as far as Erzeroum, and though prevented from penetrating as he intended into the mountains of Kurdistan, he has brought home a considerable number of very interesting plants, including above a hundred new species. He proposes to distribute these to subscribers in sets of about 700 species each, in well-dried instructive specimens, at the rate of thirty shillings the hundred, at Geneva. Any persons desirous of procuring sets may address them-

selves to M. A. Huet du Pavillon, Rue Verdaine, No. 266, Geneva, or may communicate with G. Bentham, Esq., Pontrilas House, Hereford.

Mr. Spruce's South American Plants.

By a letter in our last number it will be seen that Mr. Spruce has penetrated, by the way of the Amazon and Rio Negro, into Venezuela; and that he is about to make the attempt to reach the sources of the Orinoco. His last great excursion was a very productive one, on the Uaupés river, where he spent seven months, and has thence sent home collections amounting to 500 species, of which he considers a very large proportion to be new. Mr. Bentham will, at as early a period as possible, arrange the sets ready for distribution; and we take this opportunity of saying that a few (though very *good*) sets of the former collections still remain on hand.

Drummond's Plants from the North of Western Australia.

The general nature of this collection will be best understood by a perusal of Mr. Drummond's letter, published in our last volume, p. 115, etc. The number of species does not much exceed two hundred; they are indeed rather a *selection* than a collection; and being made during an eighteen months' excursion, extending to a distance of three hundred miles north of the Swan River, they may be expected to contain, as they really do, many new species, and particularly fine *Proteaceæ.* The specimens are in excellent condition, and the sets are placed in the hands of R. Heward, Esq., Young-street, Kensington, for distribution.

Plants of Tunis.

Mr. P. B. Webb has been instrumental in sending out an able collector, M. Kralick, to the dominions of the Dey of Tunis; and it is to be hoped that sets will be made up and allowed to be purchased by those stay-at-home botanists who desire to possess the plants of this region of Barbary.

Schlechtendal's Linnæa.

We are most happy to have it in our power to be able to correct an error into which we had inadvertently fallen, to the effect that this important work was to be closed with the 25th volume. It is stated in the 'Botanische Zeitung' that arrangements are made for its continuance, and with greater regularity than ever.

NOTICES OF BOOKS.

GENERA PLANTARUM FLORÆ GERMANICÆ, *Iconibus et Descriptionibus Illustrata*, FASC. XXVII.; *auctore* ROBERTO CASPARY, Ph. Dr. in Univ. Berlin. Botanicen privat. docens. Bonnæ, 1853.

Dr. Caspary, whose personal acquaintance we had the pleasure of making during his residence in England, has, though a young man, distinguished himself by his ardent love of botany, and especially by his several memoirs on vegetable physiology, and we are happy to find has lent his name and his talents to the continuation of this important work: "Opus," as the title-page further states, "a Th. Fl. Lud. Nees ab Esenbeck inchoatum, deinde a Frid. Carol. Leop. Spenner et Aloysio Puttertick adjuvante Stephano Endlicher, dum vixerunt, et nunc conjunctis studiis plurium auctorum continuatum." On former occasions we have spoken favourably of this publication, and we find the same care and pains are taken in the figures and descriptions as heretofore; and, what is of great importance, diagnoses are always given where necessary, pointing out the essential characters, in a few words, by which a genus is distinguished from its affinities. The drawings are all executed by Dr. Caspary himself; and though we do not see quite the same clearness and precision as in the former plates, much more is given in the way of analysis of the anatomical structure, especially of the ovary and ovules. The present fasciculus contains eighteen plates, including certain genera of *Cruciferæ*, *Ranunculaceæ*, and *Papaveraceæ*.

KLOTZSCH, J. F.; *über* PISTIA. *Mit drei lithographirten Tafeln.* (Gelesen in der königlichen Akademie der Wissenschaften am 2 December, 1852.) Berlin, 1853.

This is a quarto *brochure* of thirty pages, giving a full history of *Pistia* and its affinities, constituting the Natural Order PISTIACEÆ, which is here made to include three Genera:—1. *Apiospermum*, Kl. (the *Pistia obcordata*, Schleid. and Kunth = *Pistia Stratiotes*, H. B. K.), native of Brazil. 2. *Limnonesis*, Kl., of which there are two species, *Pistia commutata*, Schleid. and Kunth, native of Surinam, and *Pistia Friedrichsthaliana*, Kl., from St. Juan de Nicaragua. 3. *Pistia*, Linn.: under this genus Dr. Klotzsch enumerates seventeen species, of which the majority are new, inasmuch as most botanists have been disposed to consider that there was only one true species dispersed over almost all the warm parts of the globe. Whatever difference of opinion however naturalists may entertain on the subject of genera and species of this small, but very remarkable group of plants, there can be none as to the merits and execution of the figures of *Stratiotes Texensis*, Kl., collected by Lindheimer. The analysis of the flower and fruit, and the anatomical structure, are alike excellent. We wish the figures had been illustrative of one or both of the new genera, rather than of a species which, as we possess it, and from Lindheimer too, we should have had no hesitation in pronouncing identical with the East Indian *P. Stratiotes*.

LINDLEY, PROFESSOR: FOLIA ORCHIDACEA; *an Enumeration of the known species of Orchids.* Part V. 8vo. London, 1854.

In this Part the vast genus *Epidendrum*, counting 246 species in all, is concluded. The rest is occupied by *Miltonia*, Lindl. (9 species); *Brassia*, Br. (17 species); *Ada*, Lindl., nov. gen. (1 species, *Ada aurantiaca*, from New Granada); *Polychilos*, Kuhl and Hasselt (1 species); *Corymbis*, Thouars (1 species); *Sobralia*, R. et P. (24 species); *Cœlogyne*, Lindl. (44 species); and *Panisea*, Lindl. (4 species.

Argania Sideroxylon. R et S.

Fitch, del et lith

F Reeve, imp

Argania Sideroxylon, R[illegible]

On the "Argan" Tree *of Marocco* (Argania Sideroxylon); *by* Sir W. J. Hooker, K.H., D.C.L., F.R., A., and L.S.

(With 2 Plates, Tab. III., IV.)

Through the kindness and by the exertions of the Earl of Clarendon, Chief Secretary for Foreign Affairs, the Royal Gardens of Kew have been put in possession of living plants and fresh seeds of a tree or shrub very little known in Europe, little known even to botanists, but highly esteemed by the Moors, in those parts of Marocco where it is a native, for its *useful* qualities, viz. the "*Argan.*" Its economical properties are best explained by the copy of a letter, which his Lordship did me the favour to communicate along with the plants and seeds, from Henry Grace, Esq., British acting Vice-consul at Mogador, addressed to J. H. Drummond Hay, Esq., Her Britannic Majesty's Agent and Consul-General at Tangiers; both of which gentlemen spared no pains in procuring the information and seeds and living specimens; an example we should be glad to see followed by our Consuls in other countries abounding in new and useful plants.

"Mogador, November 7th, 1853.

"Sir,—The *Argan* tree grows more or less throughout the States of Western Barbary, but principally in the province of Haka, and south of this town. The soil in which it is found is light, sandy, and very strong; it is usually seen upon the hills, which are barren of all else, and where irrigation is impossible.

"I should imagine, from the appearance of some of the trees, that they are from one to two hundred years old; and a remarkably large one in this neighbourhood is probably at least three hundred. This individual measures 26 feet round the trunk; at the height of three feet it branches off; the branches (one of which measures 11 feet in circumference near the trunk) rest upon the ground, extending about 15 feet from the trunk, and again ascend. The highest branch of this tree is not more than 16 to 18 feet from the ground, while the outer branches spread so as to give a circumference of 220 feet; this is the largest I am aware of.

"The mode of propagation, in this vicinity, is mostly by seed. When sowing this, a little manure is placed with it, and it is well watered until it shoots; from which period it requires nothing further. In from three to five years after sowing it bears fruit, which ripens between

May and August (according to the situation of the tree). The roots extend a great distance underground, and shoots make their appearance at intervals, which are allowed to remain, thus doing away with the necessity of transplanting or sowing. When the fruit ripens, herds of goats, sheep, and cows are driven thither; a man beats the tree with a long pole, and the fruits fall and are devoured voraciously by the cattle. In the evening they are led home, and when comfortably settled in their yards, they commence chewing the cud and throw out the nuts, which are collected each morning as soon as the animals have departed upon their daily excursion. I have heard it remarked that the nut passes through the stomach, but this is only a casualty, and not a general rule. Large quantities of the fruits are likewise collected by women and children: they are well dried, and the hull is taken off, and stored for the camels and mules travelling in the winter, being considered very nutritious.

"The process of extracting the oil is very simple. The nuts are cracked by the women and children (and not a few fingers suffer at the same time, owing to the want of proper tools, for the nuts are very hard, and a stone is the only implement used); the kernels are then parched in a common earthen vessel, ground in handmills of this country, and put into a pan; a little cold water is sprinkled upon them, and they are well worked by the hand (much the same as kneading dough), until the oil separates, when the refuse is well pressed in the hand, which completes the process. The oil is left to stand, and the sediment removed. The cake (in which a great deal of oil remains, owing to the want of a proper press) is generally given to the milch-cows or goats.

"I never heard of any part being used as manure, but I have no doubt it would form an excellent one.

"Some of these *Argans* grow in clusters, others are single trees.

"I have, etc.,

"(Signed) HENRY GRACE.

"To J. H. Drummond Hay, Esq., etc. etc."

Except a brief notice of the exportation into Europe of Argan oil, by the Danish Counsellor of State, Georges Höst, who travelled in the kingdoms of Marocco and Fez during the years 1766–1768, the only published account of the uses of the *Argan* is given in a very little-known Danish work, published by P. K. A. Schousboe, entitled 'Jagt-

tagelser over Vextriget i Marokko. Forste Stycke. Kiobnhavn, 1800. 4. 7 Tab.,' of which a German edition appeared in 1801, in 8vo, by J. A. Markussen. It gives an account of some Marocco plants; and, after an introductory sketch of the physical geography of Marocco, it contains descriptions of the plants of the country, in Latin and German, with occasional observations in German. The account of the Argan, under Retz's name of *Elæodendron Argan*, is long; first comes a technical description, followed by a history of its synonymy, and then the following notes (kindly translated for us by Mr. Bentham).

"It is surprising that this tree should hitherto have been so little known; as it is found in a country near Europe, and visited by many travellers, who speak in their diaries and descriptions of *Oil of Argan*, and of *Argan-trees*, these last as constituting a considerable proportion of the forests of the country. It is however not to be met with in the northern provinces, but only towards the south. All those persons, from whom I have sought more accurate information on the subject, are unanimous in stating that it only grows between the rivers Tansif and Suy, that is, between the 29° and 32° N. lat., and there constitutes forests of considerable extent. It flowers in the middle of June, and the fruit remains on the tree the greater part of the year. The young fruit sets in the end of July or beginning of August, and grows slowly till the rainy season commences, towards the end of September. It now enlarges rapidly, and attains its full size during that season, so as that by the middle or end of March it is ripe enough to be gathered for economical uses. Both the fruit and the wood are serviceable, but especially the former; for from the kernel an oil is extracted, which is much employed for domestic purposes by the Moors, and is an important production of the country, as it saves much olive oil, which can thus be thrown into commerce, and made to bring money into the country. It is calculated that in the whole *Argan* region one thousand hundredweight of oil is annually consumed, thus setting free an equal quantity of olive oil for exportation to Europe. Our countryman Höst, in his 'Efterretninger om Marokos,' p. 285, says that the Argan oil is exported to Europe, where it is used in manufactures. Such may have been the case in former times, when it might be cheaper, but now there would be no advantage in doing so, as it costs almost as much as olive oil. At present no Argan oil whatever is exported.

"As the practice in preparing this oil is somewhat different from

that of common olive oil, it may be useful to enter into some details on the subject. I have myself been present during the whole operation, and consequently speak from experience.

"In the end of March the countryman goes into the wood, where the fruits are shaken down from the trees and stript of their husks on the spot. The green fleshy pericarp, which is good for nothing else, is greedily eaten by ruminating animals, such as camels, goats, sheep, and cows, but especially by the two first. Therefore when the Arab goes into the woods to collect Argan nuts, he gladly takes with him his herds of the above animals, that they may eat their fill of the green husks, whilst he and his family are collecting and shelling the nuts. The horse, the ass, and the mule, on the contrary, do not like this food. When a sufficient quantity of nuts are collected they are brought home, the hard wooden shell is cracked between stones, and the inner white kernels are carefully extracted. These are roasted or burnt like coffee on earthen, stone, or iron plates; in order that they may not be too much done, they are constantly stirred with a stick. When properly roasted they should be all over of a brown colour, but not charred on the outside. The smoke which is disengaged during the process, has a very agreeable odour. As soon as the kernels have cooled, they are ground in a handmill, into a thick meal, not unlike that of pounded almonds, only that it is of a brown colour, and the meal is put into a vessel, in which the oil is separated, which is done by sprinkling the mass every now and then with hot water, and keeping it constantly stirred and kneaded with the hand. This process is carried on till the mass becomes so hard that it can no longer be kneaded: the harder and firmer are the residuary coarse parts, the more completely is the oil extracted. At the last, cold water is sprinkled upon it, in order, as they say, to expel the last particles of the oil. During the operation the oil runs out at the sides, and is from time to time poured out into a clean vessel. The main point to be attended to in order to extract the greatest quantity and the best quality of oil, is that it should be well kneaded, and that the proper proportion of hot water for the extraction of the oil should be used; it is always safer to be sparing of it, than to be too profuse. The residuary mass, often as hard as a stone, is of a black-brown colour, and has a disagreeable bitter flavour. The oil itself, when it has settled, is clear, of a light brown colour, and has a rancid smell and flavour. When it is

used without other preparation in cooking, it has a stimulating and pungent taste, which is long felt on the gums. The vapour which arises, when anything is fried in it, affects the lungs and occasions coughing. The common people use it generally without preparation; but in better houses it is the custom, in order to take off that pungency, to mix it previously with water or to put a bit of bread into it and let it simmer before the fire.

"The wood, which is hard, tough, fine-grained, and of a yellow colour, is used in house-carpentry, and for other purposes."

We have been at some pains to distribute the seeds of this plant, with which we have been liberally supplied, to various parts of the East Indies, and to such of our Colonies as appeared suited to the growth of this tree, in respect of climate, etc. It is impossible for seeds to be in better condition; and though the surrounding hard portion or nut is as thick and solid as that of a hickory, those which we ourselves sowed sprouted in less that a month from the time they were put in the ground. The young trees too bore the rough treatment of the voyage in midwinter remarkably well; and it is easy to see that this is a plant of ready culture in favourable climates.

The value of the husks of the fruit as food for cattle, and the uses of the wood, are mentioned in the above extracts. The nature of the oil seems only to have been considered in relation to olive oil. But vegetable oils are now so much in demand, especially by the Messrs. Price and Co., for their great candle-works at Vauxhall, as well as at Birkenhead near Liverpool, that I was anxious to know the opinion of Mr. G. F. Wilson, the scientific director of those vast establishments, on the nature of the Argan oil. Some seeds were consequently communicated to that gentleman, and he lost no time in experimenting upon them, and assuring me that "they contain a large percentage of a very fine oil. We have tried it in several ways, in each case with a favourable result. Some is now being exposed to a severe test, to show how the air acts upon it; I have however little fear that it will answer. Our city friends are inquiring for us the best means of getting a ton or two of the nuts for experiments on a large scale. The only unfavourble point I see is the small weight of kernel to that of hard shell:—

"6 Nuts gave—kernel 30 grains.
,, hard shell 350 grains.
,, outer husk 193 grains.

"The hard shell probably should be sent home with the seed, when the kernels are required to yield a *sweet* oil; for unless prepared with great care, hardly to be expected in a wild country, the oil would not be nearly so sweet if sent home expressed, instead of in its kernel and shell. Perhaps if the kernel is pounded and rammed tightly into casks, we might obtain sweet oil without great waste in freight*."

In a botanical point of view this plant is scarcely of less interest than in an economical. It has had the hard fate, often the consequence of being with difficulty procured, to be much misunderstood, and, except by Schousboe, is imperfectly described; and references are given in

* While in the act of committing our MS. to press, we have the pleasure to receive from M. le Vicomte de Noé, of Paris, a very interesting "Mémoire sur l'*Argania*, recommandé comme plante oléagineuse," published in the 'Revue Horticole de Paris,' for April, 1853. This was prepared by that nobleman in consequence of the French Minister of Marine having received fruits of the Argan from the Captain of the frigate Maisonneuve, who, while on the Marocco station in 1852, heard reports of the value of the oil and of the wood of *Argania Sideroxylon*, and conceived that the tree would succeed in the southern provinces of France. The author then gives a detailed history of the plant, describing it from specimens in the Paris Herbaria, etc. We find him in error only in attributing to Schousboe the credit of constituting a new genus of the plant.

The conclusions to which he comes in regard to naturalizing the plant in France, are thus expressed:—"Nous avons dit plus haut que l'arbrisseau Africain se rencontre localisé dans un espace très borné, et qu'il est accoutumé à une température donnée et à une humidité régulière et prolongée, sans lesquelles son fruit ne pourrait ni croître ni mûrir. Cette influence chaude et hygrométrique de l'atmosphère, qui lui est si nécessaire, ne se rencontre point dans nos climats. Il est donc peu probable que l'on parvienne à la naturaliser en France. Les Botanistes, qui savent que jusqu'ici aucun représentant de la famille des *Sapotées* ne croît en Europe, doivent regarder comme certain le non-succès des tentatives d'acclimatation qui seraient faites."

On the nature and relative value of this oil M. le Vicomte comes to a different conclusion from our friend Mr. Wilson; but it is to be observed that the latter gentleman's results are derived from oil expressed by himself from fresh nuts, scientifically extracted, while M. de Noé's views are based upon the account of the oil prepared by the ignorant Moors, as related by Schousboe.

"Admettons d'ailleurs, pour un moment," he continues, "que l'*Argania Sideroxylon* puisse être naturalisé, et voyons si l'huile qu'on extrait de ses semences pourrait être livrée au commerce avec quelque profit. Ce que nous avons rapporté de l'odeur et de la saveur de cette huile suffit pour écarter déjà toute pensée de la faire servir à des usages alimentaires. Resterait l'éclairage, la fabrication du savon, le corroyage des cuirs; mais ici encore elle trouverait une concurrence redoutable dans les huiles de Colza, de Navette, de Moutarde, de Cameline, connues sous la dénomination d'huiles de graines, qui sauront toujours mériter la préférence de l'industrie pour leur abondance, leur qualité supérieure et le bon marché."—For the sake of the wood, however, "qui est dur, fort beau, et qui trouverait incontestablement un débit avantageux pour les ouvrages de marqueterie," M. de Noé strongly recommends its cultivation in Algeria: and when, in addition to that, we consider the forage for cattle yielded by the husks, and the oil, as described by one so competent to judge as Mr. Wilson, we are fully justified in urging the cultivation of the Argan in our warm colonies, and in many parts of the East India Company's possessions.

works to plants as being identical, which have no relationship with it; or to descriptions which, if the same, exhibit little or no resemblance.

The first Botanist who appears to have noticed this plant is Linnæus, who, in the 'Hortus Cliffortianus,' in 1737, described it from dried specimens, under the name of *Sideroxylon spinosum*. "From Clifford's Herbarium," observes Mr. Dryander*, "now in the possession of Sir Joseph Banks, the *Argan* was taken up by Linné in his 'Hortus Cliffortianus;' though most of the synonyms are wrong†, and consequently the locus natalis (utraque India), which is deduced from them. The specimen in Linné's Herbarium, under the name of *Sideroxylon spinosum*, is without flowers, and it is impossible to tell with any certainty what it is. Clifford's Herbarium is therefore the only authority by which this species can be ascertained." His *Rhamnus Siculus*, in the Appendix to the third volume of the twelfth edition of the Systema Naturæ, is, we are assured by Mr. Dryander, "the *Argan*, or *Olive-tree* of *Morocco* (see Höst's Efterretninger om Marokos, p. 284), as appears from the specimen in Linné's Herbarium, which has a ticket affixed, with the name of Argan of Morocco, and which I have also compared with specimens in Sir Joseph Banks' Herbarium from Morocco." The description too of Linnæus is very correct. He errs only in considering the plant to be the same as the *Rhamnus Siculus pentaphyllos* of Boccone (Rhus pentaphyllum, *Desf.*), which has folia quinata, which latter he introduces into the specific character, but not into the description; and he erroneously followed Boccone in giving Sicily as the native country in addition to Africa, and in adopting the specific name *Siculus*.

In the 'Species Plantarum' of Linnæus, Malabar alone is mentioned as the native country of the *Sideroxylon spinosum*. Nevertheless, with the exception of Willdenow, who rejects it altogether as "planta valde dubia, forte nullibi obvia," most of the older authors adopt this name for the *Argan* of Marocco. Under it, it appears in the first edition of 'Hortus Kewensis,' with the reference to 'Species Plantarum' of Linnæus, and to Commelyn, Hort. Amstelod. tab. 83, where however nothing is said of its native country, further than may be surmised

* Remarks "On Genera and Species of Plants which occur twice or three times under different names in Professor Gmelin's edition of Linnæus's Systema Naturæ," in Trans. of Linnean Society, vol. ii. p. 225.

† The Linnæan synonyms are considered by Willdenow, as far as Commelyn, Plukenet, Rheede and Burmann are concerned, to belong to *Flacourtia sepiaria*.

by the name adopted from Breynius's 'Lycio similis frutex *Indicus* spinosus, Buxi folio" (which, as already observed, Willdenow considered to be his *Flacourtia sepiaria*, from India), and of which the flowers and fruit were unknown to the author. If this were the *Argan*, it was in cultivation in Holland as early as 1697. At a period not much later, viz. in 1711, according to Hortus Kewensis, it was introduced into England: "*Cult.* 1711, by the Duchess of Beaufort, *Br. Mus.* H. S. 141. fol. 39*." It is indicated as a stove-plant.

Sir James Smith, article *Sideroxylon spinosum* in Rees' Cyclopædia (1819), throws no new light upon the subject; he omits the reference to Commelyn. Retz, in Obs. Bot. vol. vi. p. 26, refers the plant to *Elæodendron*, in which he is followed by Willdenow and by Schousboe, which latter author has given by far the fullest and best account of the plant botanically and economically.

M. Corréa de Serra, Annales du Muséum d'Histoire Naturelle, 1809, tom. viii. p. 393. tab. v. f. 1, has published a very good analysis of the fruit, with very brief characters and no observations. At length Mr. Brown, "Botanicorum facile princeps," in his invaluable Prodromus, under his Observations on *Sapoteæ*, says, "*Sideroxylon spinosum*, L., fructu valde diversum proprium hujus ordinis genus efficit;" and, acting upon his suggestion, Rœmer and Schultes, 'Systema Vegetabilium,' vol. iv. p. xlvi. and 502, have formed of this plant a new genus, *Argania*, in which they have been followed by Endlicher and Alphonse De Candolle. In this latter work a very full generic character is given, which needs not here be repeated. We are happily able to publish for the first time a figure of a flowering specimen, (gathered in Marocco by Broussonet, and deposited in the Herbarium of the late Professor Gouan, which came into our possession,) as well as of the fruit and seed; and we conclude this notice by a brief description of the genus and species.

ARGANIA, *Rœm. et Sch.*

Nat. Ord. SAPOTACEÆ.

Gen. Char. Calyx 5-partitus, lobis subæqualibus rotundatis imbricatis, basi bracteatis. *Corolla* brevis, rotato-infundibuliformis, profunde

* The abbreviation "Br. Mus. H. S. signifies the Sloanean Hortus Siccus, kept in the British Museum; from whence much information, principally concerning the plants cultivated by the Duchess of Beaufort, has been obtained."—Hort. Kew. ed. 1. Introd.

5-fidis, lobis rotundatis concavis. *Stamina* fertilia 5, lobis corollæ opposita, horum basi inserta. *Filamenta* subulata. *Antheræ* cordato-subrotundæ, versatiles. *Filamenta* sterilia tubo corollæ adnata, lobis alterna, squamæformia, e lata basi dentata, subulata. *Ovarium* ovato-globosum, hirsutum, bi- tri- rarius 4-loculare, loculis uniovulatis. *Stylus* subulatus, staminibus longior. *Stigma* punctiforme. *Ovula* medio axis pericarpii inserta. FRUCTUS :—*Drupa* elliptica, ovata, oblonga seu subrotunda, sesquiuncialis ad biunciam longa, lævis, acuta, mono- di- tri- rarius tetra-pyrena ; *pyrenis* arcte unitis, lignoso-corneis, monospermis, non raro 1–3 abortivis. *Testa* crassa. *Endopleura* tenuis, vasculosa. *Albumen* oleosum. *Embryo* erectus, strictus, amplus, *cotyledonibus* amplis planis.—Arbor *vel* arbuscula *Maroccana*. Rami *spinosi*. Folia *parva, alterna, sæpe fasciculata, lineari- seu oblongo-spathulatis, vix petiolatis*. Flores *in axillis foliorum et spinarum aggregati, sessiles*.

Argania *Sideroxylon*. (TAB. NOSTR. III. et IV.)

Argania Sideroxylon, *Rœm. et Schult. v.* 4. *p.* xlvi. *et* 502. *Alph. De Cand. Prodr. v.* 8. *p.* 187. *Walp. Repert. v.* 6. *p.* 455. *De Noé in Revue Horticole,* 1853. *p.* 125.

Sideroxylon spinosum, *Linn. Hort. Cliff. p.* 69. *(excl. syn. et local.)* —*Correa in Annales du Mus. d'Hist. Nat. v.* 8. *p.* 393, *cum Ic. fruct.*

Rhamnus Siculus, *Linn. Syst. Nat. ed.* 12. *v.* 3. *p.* 227. *(excl. syn.) non Bocc.*

Rhamnus pentaphyllus, *Linn. Syst. Nat. ed. Gmel. p.* 398. *(fid. Dryand.), excl. syn. Bocc.*

Elæodendron Argan, *Retz, Obs. Bot. v.* 6. *p.* 26. *Willd. Sp. Pl. v.* 1. *p.* 1148. *(excl. syn. Jacq. et Bocc.) Schousboe, Marocc. p.* 89.

Argan, *Dryand. in Trans. Linn. Soc. v.* 2. *p.* 225.

HAB. Forming woods in the southern and western regions of the kingdom of Marocco, principally of Haka and south of Mogador.

DESCR. This appears to form a low spreading *tree* or *shrub*, varying in size according to locality; probably rarely, if ever, exceeding 16–18 feet in height, but with a diameter of trunk large in proportion to the height. Recently imported living plants, now before me, though not more than a foot or a foot and a half high, have the appearance of considerable age, from their thick trunks (thicker than one's wrist) and crooked and seemingly stunted branches ; *branches* spiny : the *branchlets* themselves are often spinescent, like our *Prunus spinosa*, and there is

besides, in the infant seedling plants (three or four weeks old), a sharp subulate spine, ½ an inch or more long, at the base of each alternate leaf; and, in the old plants, at the base of each fascicle of leaves. *Leaves* in the old plants fasciculated, spreading, from ¾ of an inch to nearly an inch long, linear or oblong-spathulate, obtuse, glabrous, penniveined, subcoriaceo-membranaceous, persistent, tapering at the base, but scarcely petiolate. *Flowers* in small clusters or glomerules, in the axils of the spines and leaves; sessile, minute, subtended by a few hairy orbicular bracteas. *Calyx* cup-shaped, deeply five-lobed; *lobes* rounded, imbricated, rather unequal, externally hairy. *Corolla* short, between infundibuliform and rotate: *tube* short; *limb* of five, erecto-patent, rounded, concave *lobes*. *Stamens* five, fertile, opposite to the lobe of the corolla and inserted on their bases. *Filaments* subulate, thick, as long as the lobes of the corolla. *Anther* cordato-rotundate, large for the size of the flower, versatile. Alternating with them, in the tube of the corolla, are five *abortive stamens*, reduced to scales, which, from a broad toothed base, are subulate, half as long as the lobes of the corolla. *Ovary* ovato-globose, hairy, one- to four-celled. *Cells* with a single *ovule* attached to the central axis. *Style* subulate, rather longer than the corolla. *Stigma* a mere point. The *fruit* is a *drupe* about the size of a pigeon's egg, but varying a good deal in length and breadth; oblong, ovate, elliptical, or almost globose. Outer coat between coriaceous and pulpy. Within are from one (by abortion) to four *pyrenæ*, or hard, thick, between woody and horny *nuts*, firmly united into one, so that sometimes the place of union is quite obliterated. Each of these, except in case of abortion, contains a large *embryo*, with a small inferior *radicle*, and two large compressed oval cotyledons, surrounded by an oily *albumen**.

* We are just now, on concluding the printing of this article, referred to 'Symmond's Commercial Products of the Vegetable Kingdom,' p. 533, for a notice under the head of "Almond Oil," which would appear to refer to *Argan* oil; but the author gives no authority, and appears to have been at no pains or trouble to throw any light upon the subject. "To the south of the Empire of Morocco," says Mr. Symmonds, "there are forests of the Arzo-tree, which is thorny, irregular in its form, and produces a species of Almond exceedingly hard. Its fruit consists of two almonds, rough and bitter, from which an oil is produced, very excellent for frying. In order to use this oil, it requires to be purified by fire, and set on flame, which must be suffered to die away of itself; the most greasy particles are thus consumed, and its acrid qualities wholly destroyed. When the Moors gather these fruits, they drive their goats under the trees, and as the fruit falls, the animals carefully nibble off the skins, and then greedily feed.

"The oil of almonds is more fluid than olive oil, and is of a clear, transparent

EXPLANATION OF THE PLATES.

TAB. III. Flowering specimen of the *Argan:—natural size.* Fig. 1, flower and bracteas; 2, the same, calyx and bracteas removed; 3, corolla laid open, showing the fertile and abortive stamens; 4, pistil; 5, transverse section of a two-celled ovary; 6, transverse section of a three-celled ovary; 7, vertical section of the same:—*magnified.*

TAB. IV. Figs. 1–6, various forms of the fruit of Argan; 7, vertical section of a two-seeded fruit; 8, transverse section of the same; 9, Nut with two perfect seeds, and one abortive; 10, a two-seeded nut; 11, one-seeded nut; 12, transverse section of one-seeded nut; 13, transverse section of a three-seeded nut; 14, transverse section of a nut, with three perfect seeds, and one abortive; 15, longitudinal section of 13; 16, part of the husk removed from a one-seeded fruit:—all the above are of the *natural size;* 17, embryo with albumen and endopleura; 18, embryo:—*magnified.**

Journal of a Voyage up the AMAZON *and* RIO NEGRO; *by* RICHARD SPRUCE, ESQ.

(*Continued from p.* 42.)

[The letter which we last published of Mr. Spruce, from San Carlos, has been soon followed by another and no less interesting one, especially relating to the *Cryptogamia* of the valley of the Amazon, and which we now lay before our readers.—ED.]

San Carlos del Rio Negro, Venezuela, Sept. 17, 1853.

I had lately the pleasure of writing to you and of sending a few objects for your Museum; and now a few days ago I was gratified by

yellowish colour, with a very slight odour and taste. It is occasionally employed for making the finer kinds of soap, and also in medicine.

"In manufacturing it, the fruits are first well rubbed or shaken in a coarse bag or sack, to separate a bitter powder which covers their epidermis. They are then pounded to a paste in mortars of marble, which paste is afterwards subjected to the action of a press, as in the case of the olive.

"About eighty tons of almond oil are annually imported into this country, the price being about one shilling per pound. Five and a half pounds of almond oil [paste?] will yield by cold expression one pound six ounces of oil, and three-fourths of a pound more if the iron plates are heated."—Even supposing this statement to be correctly *copied*, can we place confidence in the statement itself?

* A beautiful suite of specimens, with dissections of the fruit and seed, is prepared and arranged in the Museum of the Royal Gardens, Kew, by our very zealous Curator there, Mr. Alexander Smith.

the reception of your kind letter of March 31st of the present year, informing me of the safe arrival of my sendings from San Gabriel. Tomorrow a person leaves San Carlos for the Barra, and as I do not expect another opportunity before starting up the Casiquiare, I profit by it to inform you of my movements. I have just finished building a boat with a large cabin, all of boards, and not covered in with palm-leaves, as is customary here. The boat is 11 varas (Spanish) long, and it is narrower and shallower than the one in which I came up from the Barra. On the top of the cabin I shall be able to dry a good many plants, and within it to stow them away when dried, if indeed the mosquitos will allow me to work, of which I am rather doubtful. The Flora will no doubt be very interesting: everything that is not Humboldtian will be new: and as I shall be the first naturalist to *ascend* the Casiquiare, and must of necessity creep along the river's edge, I may reasonably expect to see many things which a person descending the stream, and of course keeping near the middle, would unavoidably overlook. But I am told that I shall be unable to do anything on the voyage, and that I shall have enough to do to beat off the mosquitos. Even on land it is necessary to keep in movement; and instead of sitting down to eat a meal, one must walk about, platter in hand, and be content to swallow a considerable seasoning of mosquitos along with one's victuals. Since the waters of the Casiquiare began to fall, we have had no small share of mosquitos at San Carlos, and as I write, my hands and face are pretty well painted by them. It is not merely the pain and irritation these insects cause, which render them annoying, nor that after allowing them to suck away at your face for some time you put up your hand to brush them off and draw it away covered with blood; but, beyond this, they get into your eyes, nose, and mouth, so that you absolutely cannot tell what you are about.

In my last letter I mentioned that I had arranged to accompany the Commisario Geral of San Fernando in an expedition to the sources of the Orinoco, which was to come off next year; but he writes to me now that he is preparing a large boat, in which he intends to put twenty oars and ten soldiers, with the intention of joining me at Esmeralda. We have also news from Caracas, that the whole of the north of Venezuela is in a state approaching civil war, consequent on the recent election of a new president, against whom there is a strong party in the country, and that sanguinary conflicts have taken place

between armed bodies of horse and foot; and further, that the Commisario of San Fernando has been removed from his post, and that a person is on his way to replace him. I have therefore no great confidence in the execution of our project, but I shall go as well prepared as I can for making the observations desirable in case of my ascending the Orinoco above Esmeralda.

I told you of the great scarcity of provisions at San Carlos, in consequence of which I sent some time ago as far as the cataracts of Maypure to buy an ox, and have the salted flesh brought to me. It is only very lately that it reached me; and though it has more the appearance of thongs of leather than of beef, and is tough and strong-tasted, it is exceedingly acceptable, and it came at a time when neither fish nor flesh of any kind was to be had at San Carlos. Though thus relieved from the necessity of spending half my time in the search of eatables, I have found very little to do in the way of collecting. So long as the rainy season lasted, scarcely a tree was to be seen in flower. We are now entering on the summer, as we call it here, though the amount of rain that falls daily is scarcely diminished; and the trees by the river are flowering, but the predominant species are the same as those of San Gabriel, and by the Rio Uaupés, from its mouth to the base of the the first falls. In the angle between the Rio Negro and Casiquiare, I have got some Mosses and *Hepaticæ* that have interested me much. As my predilection for these tribes is known to many, you may perhaps have been asked whether I was doing anything in them, and if I intended to distribute the species. I have hitherto avoided alluding to Mosses in my communications to you, because the number was so few that I had no idea of their ever summing up to a quantity worth the trouble of distribution. On the Alto Rio Negro I have been more successful, and I now think that some day or other I may make up sets of those Mosses and Hepaticæ which I have gathered in sufficient quantity. Of Mosses the number of species is still small, considering the space of ground passed over, and how sharply I have looked for them during four years of travel. I suppose that in all this time I have not gathered more Mosses than I could have gathered in a month in a space of fifty miles' diameter in any part of Europe. Yet all are interesting, and a good many will be new. The general character of the Cryptogamic vegetation on the Amazon and Rio Negro seems to be quite that of Demerara and Surinam, and to bear little resemblance

to that of the rest of Brazil. The Mosses are mostly pleurocarpous, and comprise a great number of minute Hypnums, and a good many Hookerias. A pretty species of the latter genus, frequent on logs in the moist forest near San Carlos, seems to be the *Hookeria pallescens* which you described in 'Musci Exotici,' from specimens gathered by Humboldt at Esmeralda. I shall endeavour to look up all Humboldt's species from this region. Among acrocarpous Mosses, the commonest, and perhaps the most beautiful, is *Octoblepharum albidum*, which grows everywhere on trees, both in wet and dry situations; *O. cylindricum* is much less frequent, and I have mostly seen it on palm-trunks; I expect I have one or two new species of this genus. There are a good many minute species of *Fissidens*, whose habitat is chiefly on termites' nests on the ground or in trees. The genera *Macromitrium*, *Syrrhopodon*, and *Calymperes* have all representatives, but they are far from being so abundant as I expected to find them. On the other hand, I have met with species of some genera considered peculiar to cooler climates, as, for instance, an *Anacalypta* at Santarem, and a *Phascum* at San Gabriel. On the Rio Negro, a very common and a very handsome Moss is *Leucobryum (Dicranum) Martianum;* it grows on wet logs, and has the additional merit of fruiting copiously. I have been somewhat disappointed, that since I set foot in South America, now more than four years ago, I have not once seen *Funaria hygrometrica*,—the Moss which, as some one has said, more poetically than truly, "springs up wherever the wild Indian has lighted his fire." I have seen hundreds of places in Amazonian forests where Indians, wild and tame, have lighted fires, and the plants which spring up in such places are not Mosses: I shall some day be able to tell you what they mostly are. There is a Moss which seems partial to charred trunks; it resembles *Hypnum tamariscinum* in miniature, and I take it to be *H. involvens*. *Ceratodon purpureus* is an almost constant companion of *Funaria hygrometrica* in Europe, and has, like it, the reputation of being cosmopolite, but I have never seen it here.

The *Hepaticæ* have been everywhere much more numerous than the Mosses, and will, I hope, comprise much that is new. The great mass belong to the genus *Lejeunia*, but there are several species of *Omphalanthus*, *Phragmicoma*, *Mastigobryum*, *Plagiochila*, *Aneura*, *etc.* One of the commonest *Hepaticæ* on the Rio Negro is a *Sphagnoecetis*, quite like our *Jungermannia Sphagni* in aspect, but smaller, and fruiting

abundantly towards the end of the rainy season. I have a good many new species allied to common European forms, as, for instance, to *Jungermannia bicuspidata* and *trichophylla;* and a series of several species, apparently all undescribed, intermediate between foliose and frondose *Hepaticæ.*

Very few Mosses grow on the inundated margins of the large rivers, and they are species that recur everywhere. It is necessary to plunge into the heart of the forest, and to seek out rocky rivulets and the trunks of fallen trees which lie in or near them. Hence, when I ascended the Rio Negro in November, 1851, when the river was low, although there were abundance of trees in flower, the Mosses on the banks were so much dried up as to appear almost non-existent. The contrary was the case when I came from the Rio Uaupés to San Carlos in March last, when the rivers were rising, and the rains were frequent and violent. The trunks of the inundated trees were in many cases clad with a green coating of Mosses and *Hepaticæ*, but the trees themselves were almost without exception destitute of flowers.

I shall do my best to explore the mountains at the back of Esmeralda, but I do not expect much from them. The great peculiarity of the mountains I have hitherto visited is that they are hills without valleys—lumps of granite sticking up out of the plain. They seem all destitute of water; and this is probably the reason why they are quite uninhabited, there not being, so far as I can learn, so much as an Indian's hut on all the mountains of the Rio Negro and Alto Orinoco.

I am glad to find that my specimens, both for the Herbarium and Museum, have given you satisfaction. It is the certainty that my friends in Europe will appreciate my labours, that enables me to bear up under the hardships of travel in this region. I have no doubt that a stronger man than I might do more, but even the strongest must be content to lose a great deal of time among a people so lethargic as this, as Mr. Wallace can better inform you. My health, about which you so kindly inquire, is much as it was in England,—easily disordered, but (with care) rarely seriously affected. I suppose I am so thoroughly acclimated to the tropics that I shall take ill to a cold climate again.

I am much interested with what you tell me of your Museum and the *Victoria*-house. As a general rule there are no aquatics (save Podostemons) on the Rio Negro, and no Grasses.

(To be continued.)

FLORULA HONGKONGENSIS: *an Enumeration of the Plants collected in the Island of Hongkong, by* Major J. G. Champion, 95*th Reg.*; *the determinations revised and the new species described by* GEORGE BENTHAM, ESQ.

(*Continued from p.* 78.)

AMENTACEÆ *et affines.*

Major Champion's collection contains eight very distinct species of Oak, none of which am I able to identify with any East Indian ones, and four appear to be as yet unpublished, although the acorns are in some instances wanting to complete the identification or description. If to these we add the *Q. thalassica* of Hance, which I do not recognize among them, the number of species in this small island amounts to nine, besides one of *Castanea*, representing all three of the sections characterized by Blume in his 'Museum Botanicum,' viz.: *Lepidobalanus*, Endl. (Blume, 2nd section), with the scales of the cup more or less distinct at the tips, and imbricate; *Gyrolecana*, with these scales united in concentric zones, and *Castaneopsis*, with the cup irregularly zoned and almost closed over the acorn.

1. Quercus (Lepidobalanus) *cornea*, Lour. Fl. Cochinch. p. 572.—*Synædrys ossea*, Lindl. Introd. Nat. Syst. vol. ii. p. 441.

A tree in the woods of the Happy Valley, furnishing the edible fruit mentioned by several travellers as sold in the markets of Canton, and well described by Loureiro. The young shoots are slightly tomentose, the full-grown leaves glabrous, 2–3 inches long, abruptly acuminate, and usually slightly sinuato-dentate below the point, coriaceous and shining, rather paler underneath, with nine to fifteen prominent parallel veins on each side of the midrib, and transverse, almost parallel, slightly anastomosing veinlets, often scarcely visible; the petioles slightly tomentose and rather slender, from 3–6 lines long. The amenta are androgynous, few and simple, the flowers closely sessile and distinct, the eight or ten lowest female with three linear styles, the remainder male, with six divisions to the perigon and ten to twelve stamens. The acorn and cup as described by Loureiro, Lindley, and Hance.

2. Quercus (Lepidobalanus) *reversa*, Lindl. in Paxt. Fl. Gard. vol. i. p. 58. ic. xyl. 36.

A tree in the Happy Valley woods. The specimens are in flower

only, but, as far as they go, agree with the above-quoted figure and description as well as with the specimens of *Q. reversa* from North China. The leaves are rather more acuminate, and when young covered on the upper side with a minute golden dust, which however soon disappears.

The *Q. thalassica* of Hance (Kew. Journ. Bot. v. i. p. 176) is probably nearly allied to the above, bnt the description does not quite agree with it.

3. Quercus (Lepidobalanus) sp. n.? affinis *Q. glabræ*, Thunb., et *Q. spicatæ*, Sm.

Victoria Peak. The specimen has male flowers only, which show it to be distinct from, though allied to, the two species above mentioned, but are nevertheless insufficient to characterize it without the female flowers or fruit.

4. Quercus (Lepidobalanus) *Harlandi*, Hance in Walp. Ann. Bot. Syst. vol. iii. p. 382.

A tree in the Happy Valley woods.

5. Quercus (Gyrolecana) *Championi*, Benth., sp. n.; ramulis novellis furfuraceo-tomentosis, foliis petiolatis obovatis oblongisve obtusis coriaceis supra nitidis subtus lepidoto-incanis, amentis tomentosis masculis subfasciculatis fœmineis solitariis dissitifloris, cupulis tomentosis concentrice annulatis.—*Arbor*. *Ramuli* novelli subangulati, tomento furfuraceo ferrugineo vestiti, demum teretes et canescentes. *Stipulæ* subulatæ. *Folia* approximata, 2–3 poll. longa, circa 1 poll. lata, omnia in speciminibus suppetentibus apice rotundata et obtusa, basi plus minus acutata, margine integerrima et subrecurva, novella supra lana furfuracea mox derasa vestita, adulta supra glaberrima et nitida, subtus incana et lepidoto-tomentosa, venis primariis secus costam utrinque 4–6 subtus prominulis et fere ad marginem attingentibus, venulis vix conspicuis. *Petioli* 3–5 lin. longi. *Amenta mascula* 1½–2-pollicaria, ferrugineo-tomentosa. *Flores* sessiles, approximati, subfasciculati. *Perigonium* semi-5-fidum. *Stamina* 6–8, filamentis basi pilosis perigonium vix æquantibus. *Amenta fœminea* masculis breviora. *Flores* 6–10, sessiles, involucro annulato brevi circumdati, squamis indistinctis. *Perigonium* urceolatum, 5-dentatum. *Ovarium* triloculare, styli ramis exsertis clavatis. *Capsulæ* fructus junioris incano-tomentosæ, concentrice triannulatæ, glandulis nondum in specimine accretis.

A tree not uncommon in the woods of the Happy Valley, Victoria

Peak, etc. It differs from all the *Gyrolecanæ* known to me, in the leaves, which are not unlike those of some of the larger entire-leaved varieties of our *Q. Ilex*.

6. Quercus (Gyrolecana) *salicina*, Bl. Mus. Bot. vol. i. p. 304?

A common tree in the Happy Valley woods, and may be, as suspected by Blume, a mere variety of *Q. glauca*, Thunb., of which it has the flowers and fruit, but with very much narrower leaves (mostly two to three inches long, and four or five lines broad) and shorter petioles.

7. Quercus (Gyrolecana?) *Eyrei*, Champ., sp. n.; glaberrima, foliis breviter petiolatis ovatis v. ovato-lanceolatis longe acuminatis pauci-serratis coriaceis concoloribus nitidis, amentis maculis paniculato-ramosis glabris dissitifloris.—*Arbor*. *Folia* 2–3 poll. longa, 1–1½ poll. lata, basi cuneata, petiolo 1–3 lin. longo, serraturis sub cuspide paucis obtusis inæqualibus, venis primariis a costa divergentibus utrinque 7–11 tenuibus longe intra marginem anastomosantibus, rete venularum vix conspicuo. *Panicula* mascula ramosissima, amentis virgatis 1½–2 poll. longis, rhachi glaberrima, floribus omnibus distinctis sessilibus. *Perigonium* sæpius sexpartitum, foliolis latis fere petaloideis glabris margine ciliolatis. *Stamina* 10–12, longe exserta. *Discus* villosus.

Abundant in Wang-nai-chang wood, on the east side of Happy Valley. The specimens have neither fruit nor female flowers to determine the section to which it belongs, but the aspect is more that of a *Gyrolecana* than of a *Lepidolabanus*, and it is probably allied to *Q. glauca* and *Q. salicina*, though certainly distinct from both.

8. Quercus (Castaneopsis) *fissa*, Champ., sp. n.; foliis petiolatis ample ellipticis calloso-pauciserratis supra glabris subtus tenuiter argenteo-lepidotis, amentis masculis glabris paniculatis, fructibus spicatis, cupulis ovoideis irregulariter zonatis glandem includentibus demum irregulariter fissis.—*Arbor*, ramulis novellis subangulatis demum teretibus glabris. *Folia* 6–8 poll. longa, 2–3 poll. lata, breviter et obtuse acuminata, basi cuneata, supra viridia at non nitentia; venæ primariæ a costa divergentes, utrinque circa 15 subtus prominulæ et etiam supra conspicuæ, venulæ transversæ subparallelæ præsertim in pagina superiore evidentes, subtus indumento tenuissimo argentato v. interdum fere aureo obtectæ. *Panicula* supra folium supremum sessilis et eo paullo brevior. *Amenta mascula* numerosa, subramosa. *Flores* sessiles, dissiti, solitarii v. per 3–4 glomerati, plerique 6-par-

titi, foliolis subpetaloideis margine ciliolatis. *Stamina* 10–12, longe exserta. *Discus* villosus. *Amentum fœmineum* in media panicula unicum, masculis paullo brevius, floribus sessilibus solitariis dissitis. *Perigonium* 5-partitum. *Styli* 3, vix basi connati, ovoidei, basi villosi. *Spica fructifera* in specimine 5-pollicaris. *Squamæ* coadunatæ in cupulam ovoideam 8–9 lin. longam, fere clausam, extus zonatam et leviter canescentem, intus sericeo-villosam, ad maturitatem in lacinias latas obtusas irregulariter fissam. *Glans* ovoidea, semipollicaris, castanea, glabra.

Abundant on the skirts of the Happy Valley woods.

9. Castanea *concinna*, Champ., sp. n.; foliis oblongo-lanceolatis acuminatis integerrimis basi cuneatis coriaceis supra glabris subtus ramulis inflorescentiaque incano-tomentosis, amentis subpaniculatis masculis pluribus fœmineis brevibus solitariis terminalibus, fructu echinato.—*Arbor*. *Folia* circa 3 poll. longa, 9 lin. lata, venis primariis a costa divergentibus utrinque 12–15 subparallelis subtus prominulis intra marginem evanescentibus, venulis inconspicuis. *Petioli* 2–3 lin. longi. *Stipulæ* subulatæ, sericeo-pilosæ, caducissimæ. *Amenta mascula* $1\frac{1}{2}$–2-pollicaria, ad axillas foliorum nascentium solitaria, paniculam formant terminalem, ramulo quoque sæpius amento fœmineo unico brevi terminato. *Flores* sessiles, pentameri, staminibus in masculis circa 10 longe exsertis stylis in fœmineis 3, linearibus obtusis. *Fructus* aculeis fasciculato-ramosissimis densissime echinatus, maturitate valvatim hians, nuce glandiformi depresso-globoso solitario pilis adpressis caducis leviter consperso.

In the Happy Valley woods, but rare.

10. Alnus? sp. n., affinis *A. Japonicæ*, Sieb. et Zucc.

A single small specimen, with a few male amenta and very young leaves, and consequently insufficient for exact determination or description. If a true *Alnus*, it must be very near to the *A. Japonica*, although not identical as far as can be judged by a comparison with a fruiting specimen, with adult leaves communicated by Dr. Blume.

11. Myrica *rubra*, Sieb. et Zucc. Fl. Jap. Fam. Nat. p. 106, forma foliis paullo latioribus et obtusioribus.

Hongkong. These specimens agree with one from Japan, communicated to me by the late Professor Zuccarini, in every respect except that the leaves are rather broader. The foliage is very near that of some varieties of the common East Indian *M. integrifolia*, Roxb. (*M.*

sapida, Wall.), but the male amenta are, as described by Zuccarini, simple and cylindrical, about an inch long, whilst in *M. integrifolia* they are always branched or compound. The fruits are also solitary and globose, not racemose and ovoid.

Coniferæ.

Pinus *Sinensis*, Lamb.—Endl. Conif. p. 185.

This tree forms the greater portion of the tree vegetation of the Island.

Gnetaceæ.

Gnetum *funiculare*, Sm.—Wight, Ic. t. 1955.

Common in the Happy Valley and on Victoria Peak, but rarely seen in flower or fruit.

Chloranthaceæ.

Sarcandra *chloranthoides*, Gardn.—Wight, Ic. t. 1946?—*Chloranthus monander*, Br.?

In ravines. The leaves are shorter and broader, and the spikes also shorter and more dense than in the few East Indian specimens I have seen; but I can find no other difference.

Piperaceæ.

Chavica *Sinensis*, Champ., sp. n.; foliis ovatis quintuplinerviis basi profunde cordatis auriculis æqualibus rotundatis supra glabris subtus molliter pubescentibus, amentis masculis brevissime pedunculatis reflexis.—*Ramuli* puberuli, demum glabrati. *Folia* 3–4 poll. longa, 1½–2 poll. lata, obtusa, infra medium latiora, sinu baseos profundo clauso, auriculis late rotundatis sese incumbentibus, crassiuscule membranacea, supra glaberrima, subtus reticulata et pube brevi fere velutina. *Petioli* 4–6 lin. longi. *Amenta mascula* pollicaria v. paullo longiora, crassiuscula, pedunculo recurvo crasso vix 2 lin. longo. *Squamæ* peltatæ, etiam subtus glabræ. *Stamina* 2. *Amenta fœminea* non vidi.

Ravines of Victoria Peak. The specimens gathered are all males.

Aristolochiaceæ.

Aristolochia *longifolia*, Champ., sp. n.; fruticosa, ramulis velutino-villosis, foliis longe lanceolatis supra glabratis subtus sericeo-villosis,

pedicellis fasciculatis, perigonii ampli extus villosi tubo cucullato-refracto, labio late rotundato trilobo.—*Frutex* pedalis v. paullo altior, trunco crasso nodoso cortice griseo lævigato, ramulis laxis, junioribus petiolis pedicellisque pube ferrugineo dense vestitis. *Folia* alterna, 8 poll. longa, 8–10 lin. v. rarius pollicem lata, apice acutata, basi rotundata v. subcordata, supra vix pube tenuissima secus costam scabriuscula, subtus pilis adpressis sericeo-villosa, reticulato-penninervia, costa prominente; petiolo semipollicari v. paullo longiore. *Flores* ad basin ramorum hornotinorum fasciculati, ampli, speciosi. *Pedicelli* circa pollicem longi, recurvi, apice paullulum incrassati. *Ovarium* 5–6 lin. longum, anguste turbinatum, dense villosum. *Perigonium* extus pilosum, sordide albo-fuscescens, venis roseis reticulatum, intus atro-purpureum; pars tubi recta sesquipollicaris, dein fere usque ad basin refractum labio iterum surrecto, fere 2½ poll. lato, lobis 3 late rotundatis brevibus.

A very rare plant, growing in the clefts of rocks in ravines of Mount Victoria. Major Champion only twice saw it in flower, in April 1848, and in May 1849. It is the handsomest of all the East Indian *Aristolochiæ*, and remarkable as well for its broad labellum as for its long narrow leaves. The flowers, when withering, emit the fetid smell of an *Arum*.

(*To be continued.*)

Report of a Journey of Discovery *into the Interior of* Western Australia, *between 8th September*, 1848, *and 3rd February*, 1849; *by* J. S. Roe, Esq., Surveyor-General.

(*Continued from p.* 88.)

Early on the next day's march we were fortunate enough to fall in with a small pool of fresh water, and six miles further on our famished animals were revelling in a beautiful patch of excellent though somewhat dry grass, growing amongst yeit-trees in a circular flat 300 yards in diameter, having found nothing better than flags and rushes at the low granite hill, for which we had been steering for the previous twenty-one miles. We hailed this additional change in the features of the country with much satisfaction, good grass being invariably found among the yeit, in a better description of soil. Although the day was

yet young, I felt compelled to encamp here for the sake of the horses, several of whom had fallen during the morning from absolute weakness. From one of these, who had thus fallen, and had staked himself badly in his ineffectual struggles to rise, a rough piece of dead wood was extracted 4½ inches long and three-quarters of an inch in diameter.

Amongst the changes perceptible hereabouts, we observed a greater variety than heretofore in the nature and qualities of the soil, which, from a general light sandy character amongst the salt lakes and samphire marshes, had now become more clayey and loamy, and altogether of a better description. It was also satisfactory to find that we were traversing a country capable of retaining fresh water at its surface, since so little rain had fallen of late; we found the granite rocks were no longer to be so fully relied upon as formerly, for those supplies which we had hitherto chiefly depended on procuring from them. As we advanced eastward next day, the country was found more undulating, and occasionally broken into large granite sheets, round one of which, near our last camp, was some good grass; but the general surface continued densely thick, and sorely tried our wearied and exhausted animals, for whom I greatly wished to procure a few days' rest and good feed. At the end of thirteen miles they could go no further, and I was compelled to halt them once more in the tall scrub, with nothing better than rushes, and without any water, nor did we prove successful in procuring any of the latter by digging. Climbing a granite ridge immediately over our camp, I looked out with much anxiety over the desolate space of not more than twenty miles, which still lay between us and Russell Range, and turned over in my mind a list, far too long, of those horses which I feared would never have strength to reach it. Granite hills were abundant to the southward, within the same distance, but I cared nothing for them at the time; and to the north the interminable frowning scrubs presented an aspect anything but cheering. The only relief appeared in a small granite hill, sixteen long miles to the east; and as it was in the direction of our intended route, I launched out for it early next morning, relying on a kind Providence for aid, and on the unsubdued spirit and energy of my little party. The poor horses staggered up to their saddling with a despondency and aspect which seemed to upbraid us with their treatment, and I felt glad to escape from the misgivings which their appearance created by commencing the toils of the journey. I should most gladly have

reconnoitred in advance on such occasions, but in so fearful a country delays were utterly inadmissible, and to have halted the party would have been certain destruction to the whole. Thus were we hurried on from day to day, without its being possible to give the wearied horses that rest which was almost indispensable to their very existence.

Travelling now became difficult in the extreme. To avoid sapling thickets, 12 to 15 feet high, so closely packed that axes only could have opened a passage, we were compelled to take a more circuitous route round them, and to force a way through scrubs of a more yielding character. These were frequently so dense, that at the distance of three or four feet no part of a horse could be seen, and the greatest care and watchfulness were necessary to keep them close together and in line. This work however could not last long, and when half-way to the granite hill, four of the horses gave convincing proofs of their inability to proceed another mile, by streaming out in those profuse cold sweats which are always the forerunner of a complete and fatal break-up. Thankful for the warning, the party was halted, the complaining horses unloaded, and arrangements immediately made for leaving behind everything that could possibly be dispensed with, including the whole of our salt meat, which had formed the entire load of one horse. But it was no easy matter to decide what, in our situation, could best be abandoned, our equipment being as light as possible, and not a single article carried that could in any view be deemed superfluous. Some little time was necessarily occupied in completing these arrangements, and our salt meat was about to be triced up to the trees destined to receive it, when the horses appeared so much revived by their short respite, that I resolved to make one more trial to get on, without the adoption of measures which might materially cripple the ultimate proceedings of the expedition. Distributing the loads therefore in proportion to the ability to carry weight, and every horse carrying a pack, we cheered them on as well as we could, kept them all moving and in close line, and late in the afternoon halted at the foot of the hill where we had hoped to obtain relief. Here however we again met with nothing but cruel disappointment: not a blade of grass was to be found either over or around the hill, and a flattering appearance of water proved to be a mere trickling over a large bare granite sheet, scarcely sufficient to wet its surface. Encamping among some rushes and scrub at this spot, in the vain hope of procuring water with our

spade, the horses were suffered to roam about the hill and pick up what they could find, while I climbed to its summit for a view of the surrounding country. Cheerless indeed was that view, and serious were the apprehensions forced upon me for the safety of the whole of the horses, in whose existence was likewise involved that of the party placed under my charge. At the distance of only four miles, the precipitous mass of rock composing the Russell Range rose abruptly in a bare, naked mass, to the height of 600 feet out of the surrounding scrubby plains, and not a blade of grass or the least appearance of fresh water were anywhere to be seen. Thickets and scrub, interspersed with sand-plains and salt lakes, covered the face of the country, except where numerous granite hills disturbed the uniformity of the southern horizon, like so many bare rocky islands rising abruptly out of the sea. We had observed natives' smokes rising up about this spot from a distance, or I should now have left all our heaviest articles and hastened our dying horses on until I found both food and water for them; but not caring to run so great a risk of losing our provisions, and feeling that one false move, in our critical situation, would compromise the safety of the whole party, the last of the small quantity of water we had carried was doled out for breakfast, and early on the morning of the 23rd, the party was moving on to ascertain the worst.

Making for the nearest part of the Range, the bush became fortunately more open, and freely admitted the passage of our exhausted and desponding animals, who staggered along under their unequal loads, as if it were the last effort they could make. Our greatest present anxiety was to keep them from falling or lying down, as, when once down, they were with great difficulty got on their legs again. Finding, on a nearer approach to the Range, that we had not been deceived as to its utter sterility on this side, we hastened towards a clump of yeit and casuarina trees at the south end; and there, to our great joy, found abundance of excellent grass in a small thickly-wooded ravine, the bottom of which was occupied by a narrow rocky watercourse. Here the party were immediately encamped; the horses required no bidding to feed after their long abstinence; and while one party was despatched round the east side of the Range, in search of water, another plied the spade in those spots giving most promise of it. Leaving one man to keep the camp, I then followed up the watercourse in the ravine: this however proved most unprofitable, and,

after much scrambling and climbing, was found to issue from a small deep cavern in the mountain, so defended by thicket and tangle as to be scarcely approachable. It was quite dry, and the spade produced lower down only a very small quantity of brackish water, of a yellow colour. That water was somewhere in the neighbourhood there appeared little doubt, by several natives' fires having started up at little more than a mile from us; and we were discussing a place for beating up their quarters, when Lee and Bob returned from their excursion round the Range, with the joyful news they had found a splendid run of excellent water near its north-east extremity, with grass in the same neighbourhood. Reloading, we lost no time in proceeding to the spot; and I had once more the gratification of encamping in a situation where the horses could recruit their exhausted energies, and prepare for the remainder of their journey. No sight could have been more welcome to us at the moment than this beautiful run of pure, cool, fresh water cascading down from the highest part of the range immediately above, and forming various lodgments in small clear pools, in which several of our poor horses immersed nearly their entire heads.

Although the feed hereabouts was neither first-rate nor abundant, I felt it necessary to remain four days to recruit and refit, and had the satisfaction to find our stud improve rapidly in spirit, although not much in appearance. The rest was of most essential service, not only to their weary limbs, but to their sore backs, in the constant attention to which neither time nor labour was spared. Every effort was made to remedy the defects in our pony pack-saddles, to make them fit the horses better; but we could effect little real good in this respect, beyond fresh arranging their padding. Our saddle-bags were also in so dilapidated a state, that we were almost at our wits' ends for devising the means of making them hold together.

While these operations were in progress, I lost no opportunity of collecting materials for my survey of the country, adding to the collections in geology, botany, etc., and making as many astronomical observations as our limited stay and the state of the heavens would permit. The result of the latter showed that, by four different stars, a lofty flat-topped peak, near the N.E. end of the range under which we had encamped, was in latitude 33° 27′ 15″ S., and longitude by chart 123° 24′ E.; the variation of the magnetic needle, by means of nine azimuths, 2° 46′ W. On ascending the peak, this section of the range was found to consist

of a sharp, narrow ridge of rugged, steep rocks, about 1½ mile in length, N. by E. and S. by W., with sides rising in many parts at an angle of less than 45° to the summit. Having seen no land that better deserves the name, I conclude this is the hill which Mr. Eyre, the original discoverer of the Russell Range from the coast, called Mount Ragged. It is a somewhat loose mass of laminated quartz and micaceous schist, dipping to the W. by N., at an angle of 7 or 8 degrees from the vertical, and intersected by numerous quartz veins, traversing the mount in various directions. The summit is about 600 feet above the base, and the latter 400 feet above the level of the surrounding limestone plains. Several remarkable transverse rents are also observable, extending from the summit to its base, and combining with other appearances to lead to a belief that the whole mass is rapidly breaking up. The other hills of this range are of similar aspect and composition, but of less elevation, and lie in a detached group 4 or 5 miles to the N.E.; the intermediate and surrounding country being covered as before with thickets and scrub, presenting an horizon 30 miles distant in the N.E. and N.W. quarters, unbroken by a single rise. In the opposite quarters appeared the mighty ocean, studded with many islands of the Recherche Archipelago, and numerous reefs, both covered and dry. The low sandy coast about Point Malcolme seemed to be not more than 15 miles distant in the S.E., and several fires of the natives smoked up amongst its sand-hills, and along the coast further to the N.E: behind which rose some granite hills of considerable elevation, similar to those which now appeared in view behind Capes Pasley and Arid. Amongst them I directed my glass long and attentively, but in vain, in the hope of discovering some inducement for prolonging my journey to the eastward; for although I had then the satisfaction of standing upon the spot pointed out in my instructions as the eastern limit for present exploration, I should not have hesitated to exercise a discretion in proceeding further eastward, had appearances and prospects in the least encouraged an advance. Such however was unfortunately not the case, not the slightest appearance of a grassy tract of country was visible in any direction, and our horses had already had too much taken out of them to warrant any further risking their lives by prolonging the examination of so fearful and impracticable a country. They had already traversed fully 1000 miles of country since leaving the Swan, and had as much more in prospect before they could reach it again.

From this point therefore I determined on returning to Cape Riche by a more southerly route, for the purpose of intercepting and examining any rivers or streams that might fall into the coast.

(To be continued.)

BOTANICAL INFORMATION.

First General Report of the Government Botanist, Dr. F. Müller, *on the* Vegetation of the Colony of Victoria, in Australia; *communicated by His Grace* the Duke of Newcastle, *Chief Secretary for the Colonies.*

[We cannot too highly appreciate the service rendered to Botanical Science by Mr. La Trobe, late Lieutenant-Governor of Victoria, in this appointment of so able and indefatigable a Botanist as Dr. Müller, to the office in question; and we can only hope that his example will be followed by other Colonial Governors, and with an equal prospect of usefulness.—Ed.]

Botanic Gardens, Melbourne, 5th September, 1853.

Sir,—In obedience to His Excellency's command, I have the honour to transmit to you my General Report, partly compiled from those documents which I forwarded on several occasions during my journey, from February until June last, and partly resting on the subsequent examination of the specimens which I brought home.

Before I enter into any details on the classification of our indigenous vegetable world, on its relation in comparison with the plants of the adjacent countries, and on the practical uses to which we might possibly apply many of its productions, it may be considered necessary to delineate the route which I pursued during my last expedition.

I proceeded, at first, with deviations from the usual road wherever it appeared favourable for my pursuits, to Futter's Range, which presents, like some other granitic mountains in its vicinity, a host of very peculiar plants. Thence I directed my course to May Day Hills, from which place I advanced, after a brief stay, to the Buffalo Ranges, where I ascended Mount Aberdeen and another peak more than 4,000 feet high, and examined the rich, almost tropical vegetation which borders the rivers rising in the mountains. It was in this locality that our

exertions were rewarded with the discovery of the high, majestic *Grevillea Victoriæ*, and other rarities. Indications of gold have been observed here, as well as in some parts of Gipps' Land which I subsequently visited. The Superintendent of the Melbourne Botanic Gardens, who was engaged during this part of the journey in collecting seeds, here quitted me, being obliged to return homeward to resume his duties at the Botanic Gardens.

As Mount Aberdeen offered hardly any plants of a true Alpine character, I resolved to ascend Mount Buller, whose summits, at an elevation of more than 5000 feet, are covered throughout the greater part of the year with snow. Travelling quite alone since leaving the Buffalo Ranges, the ascent was not accomplished without considerable danger. But I was delighted to observe here, for the first time, this continent's alpine vegetation, which in some degree presented itself as analogous with the Alpine Flora of Tasmania (*Ranunculus Gunnianus*, *Euryomyrtus alpina*, *Celmisia astelifolia*, *Gentiana Diemensis*, *Podocarpus montana*, *Trisetum antarcticum*, etc.), and which was also by no means destitute of its own peculiar species (*Phebalium podocarpoides*, *Goodenia cordifolia*, *Hovea gelida*, *Oxylobium alpestre*, *Brachycome nivalis*, *Anisotome glacialis*, etc.). Remarkably enough, only one of these exhibits any similarity to the singular subalpine forms discovered by Sir Thomas Mitchell on the Australian Grampians. Mount Buller had never before been scientifically explored; and Mount Aberdeen, up to this time, had not even been ascended.

After some other less elevated mountains in the neighbourhood had been also botanically examined, I resumed my journey along the Goulburn River and some of its tributaries to the King Parrot Creek, where I crossed the Yarra Ranges. The unusually heavy rainfall in the autumn would have frustrated any attempt to reach, as I then contemplated, the Alpine mountains of Gipps' Land, and I considered it therefore more advisable, at the already advanced season, to devote my time rather to the examination of the maritime plants which are in an almost equal state of development throughout the year.

I went, accordingly, for some distance along the La Trobe River, to the south-eastern coast of Gipps' Land, passing some rich ravines, luxuriantly filled with two species of tree-fern, *Alsophila australis* and *Dicksonia antarctica;* the former of which seemingly never accompanies the *Dicksonia* far inland, but remains in those valleys which slope

towards the sea. Notwithstanding these geographical limits, the *Alsophila*, occupying generally the drier localities on the hills, recommends itself better for transplanting.

After several weeks' travelling in the neighbourhood of Port Albert, and many excursions through Wilson's Promontory, I quitted Gipps' Land, returning homeward along the coast.

This journey, the lines of which extended over more than 1500 miles, enriched so much my collections formed during the spring that they comprise probably now more than half the indigenous vegetation of this Colony. For, according to the Index which I have annexed, including also several plants discovered previously by Sir Thomas Mitchell and by His Excellency the Lieutenant-Governor, there are known to me now already 715 species of *Dicotyledoneæ*, belonging to 286 genera and 83 Natural Orders; 201 species of *Monocotyledoneæ*, comprehending 100 Genera and 21 Natural Orders; and 47 Ferns, containing 27 genera. About fifty other species, however, which I have not included in this general account, are not yet so strictly examined as to receive their true systematic position, and are consequently not enumerated in the list; while fifty others, not indigenous, but introduced species (marked with*), are likewise not taken into account, although they are not only naturalized beyond the possibility of extirpation, but even overpower the more tender indigenous plants. I regret that I was also obliged to omit from this Index all the lower *Acotyledoneæ* (Mosses, Lichenastra, Lichens, Algæ, and Fungi), to the amount of at least 200 species, of which I could examine this winter too few to display them in a systematic arrangement. The full amount of species therefore considerably exceeds 1100, belonging, with exclusion of the above-mentioned *Acotyledoneæ* and the foreign plants, to no less than 430 Genera and 108 Natural Orders,—proportions which far surpass those of Western Australia, where more than twice this number of species (according to the collections of Dr. Preiss) are only divided into precisely the same number of genera already discovered here (430), and only into 91 families.

The Index might have been increased without difficulty to a two-fold number of names; but through a long-continued examination of the Australian plants in a living state, I had the advantage of learning how great is the uncertainty of many characteristics, which are deemed, even by our greatest authorities in science, sufficient for distinction.

According to the annexed enumeration, the proportion of the *Dicotyledoneæ* to the *Monocotyledoneæ* will be found, for that part of the country over which my investigations this year extended, to be nearly as seven to two, and it corresponds, therefore, exactly with the position which these great divisions of the Vegetable Kingdom bear to each other in South Australia up to the thirty-fourth degree south latitude (as shown in my observations on the South Australian Flora, lately read before the Linnean Society of London), and holds, likewise, the mean between the proportions ascertained by Robert Brown for Van Diemen's Land and New South Wales; while in Western Australia, as well as in South Australia, including the country there to the thirty-first degree south latitude, the number of the *Dicotyledoneæ* exceeds in the proportion of nine to two that of the *Monocotyledoneæ*.

The Cryptogamic plants, however, favoured by a more humid atmosphere, are twice as numerous in our province as in the last-mentioned Colonies, being about equal to a third of the *Dicotyledoneæ*.

Excluding all Cryptogamic plants, not fewer than 200 species, as testified by the Index, are proved to be as yet undescribed. Some of these occurred to me in South Australia; and the descriptions of several others will probably find a place in Dr. J. Hooker's forthcoming 'Flora of Van Diemen's Land.' These novelties enabled me already to establish seven new genera (*Pseudomorus*, *Basileophyta*, *Phæoleuca*, *Tetrachæta*, *Minuranthus*, *Psoraleopsis*, and *Rhytidosporum*).

The descriptions, not only of almost all the new plants, but also critical notes and observations on the phyto-geographical range of the species already known, will be forwarded to Sir William Hooker before my departure for the interior, and will afterwards constitute, together with the scientific elucidations of such plants as may be added during the ensuing season from the yet botanically unexplored districts, the foundation of 'The Flora of Victoria.'

(*To be continued.*)

Death of Professor Reinwardt.

We regret to have to announce the recent decease of Dr. C. G. C. Reinwardt, Professor of Natural History in the University of Leyden, distinguished as a Botanist by his researches in Java, and various publications.

NOTICES OF BOOKS.

Fragmenta Florulæ Æthiopico-Ægyptianæ ex plantis præcipue ab Antonio Figaro, M.D., Musæo I. R. Florentino, *missis; auctore* PHILIPPO BARKER WEBB.

In this little work, from the able pen of Mr. Barker Webb, we have a valuable contribution to our acquaintance with the vegetation of Africa, the tropical parts of which are by degrees becoming more known to us by the zeal and energy of successive travellers. M. Figari, whose collections are here described, has been long a resident in Egypt, and has travelled over a great part of that country, and of the provinces to the south, almost as far as the equator. His collections are partly from the desert regions of Middle Egypt, and partly from the Ethiopian provinces of Kordofan and Fazogli. The enumeration, which is incomplete, will, we trust, be continued, though we do not perceive any direct engagement to that effect; for the present it closes with *Rhamnaceæ* and *Terebinthaceæ* (following the arrangement of DC.), and includes about 140 species, of which rather more than one-half are Ethiopian; of these 15 are new, or at least published for the first time, for many of them have been named by Hochstetter in Kotschy's distributed collections, which appear to contain a large proportion of the species collected by M. Figari.

According to the data afforded by these collections, there would appear to be a marked difference between the vegetation of the Egyptian desert, and that of the provinces near the sources of the White Nile. Thus, while the *Cruciferæ*, *Resedaceæ*, *Caryophylleæ*, and *Geraniaceæ* of the present enumeration are all, with very few exceptions, natives of Egypt, the great majority of *Capparideæ* and *Malvaceæ*, and all the *Sapindaceæ*, *Ampelideæ*, and *Polygalaceæ*, are Ethiopian. *Malvaceæ* are very largely represented, the number of species being 35.

We observe little that calls for notice among the Orders described in the work. Several new species of *Cruciferæ* are described; and we find some important remarks on the limits of genera in that group, which, it is well known, has been a special study of the author. Under *Oligomeris* of Cambessèdes, we find descriptions of four species of that genus, the Indian, Egyptian, Canarian, and Californian being consi-

dered all distinct. It is however, we think, probable that the three former, at all events, are identical, and that the range will be found to be continuous from the Punjab to Western Africa.

Mr. Webb has appended to the list of plants an introductory dissertation, which presents some interesting details respecting the different travellers who have investigated the flora of Ethiopia, and a narrative of the districts visited by M. Figari during his twenty years' residence in Egypt. We gather from this Introduction, that a forthcoming work by the same traveller, on the physical geography and geology of Egypt, will afford much important information on the geography of plants. That he is fully competent to throw light on these subjects, is evident, from the extracts of his letters published by Mr. Webb.

M. Figari states that the Egyptian flora may be divided into four regions, characterized by different forms of vegetation:—1. The region of the Nile valley, containing many Nubian and southern plants. 2. The granitic flora of the east coast, characterized by Arabian and Abyssinian plants, many of which are very local. 3. The limestone flora of the Desert. And, 4. The Mediterranean flora.

The species of *Acacia*, which are indigenous in Egypt, are, we learn, six in number. 1. *A. Seyal*, Delile, which is common throughout the Desert, from Cairo to Wadi Reimel, but which never leaves the limestone tract. 2. Further south and east occurs a species which is often confused with *A. Seyal*, but is easily distinguished by being not a shrub, but a tall tree, by its white (not yellow) flowers, and by its falcate, spirally-twisted pods. This species, which first appears at Kossier, grows on the granite hills near the coast. It produces a red resinous gum, like kino. 3. *A. heterocarpa*, an undershrub, with very beautiful yellow and reddish flowers, which is a native of the neighbourhood of Kosseir, and of the Emerald Mountains. 4. A species which was formerly confounded with *A. Seyal* (to which indeed, and to the second species, it appears very closely allied), it is a shrub, with odorous flowers, and yields a red gum; it is found near Kossier, and becomes more abundant to the southward. 5. *A. albida*, Delile, which is confined to the banks of the Nile. 6. *A. Nilotica*, Delile, which is plentiful throughout Nubia, and produces true Gum Arabic.

Fitch del et lith.

Vincent Brooks Imp

1 Lentinus [illegible] Berk. 2 [illegible] Berk.

Fitch del. et lith.

Vincent Brooks Imp.

1. Lentinus præerigidus. Berk. 3. Cordyceps racemosa Berk.
2. C. falcata Berk. 4. Sclerographium aterrimum. Berk.

Decades of Fungi; *by the* Rev. M. J. Berkeley, M.A., F.L.S.

Decades XLI.–XLIII.

Indian Fungi.

(*Continued from* vol. iv. p. 142.)

(With two Plates, Tab. VII., VIII.)

The present ten Decades comprise the remainder of the Fungi collected by Dr. Hooker and Dr. Thomson in various parts of the Himalayas and the Indian Peninsula, to which are added a few numbers of species gathered in Ceylon by Mr. Thwaites. Only a single new genus occurs in the whole century, which is very remarkable, considering the large number of new species.

401. *Agaricus* (Lepiota) *montosus*, n. s.; pileo convexo obtuso, verrucis magnis pyramidatis crassis exasperato; stipite curto subæquali grosse verrucoso; lamellis postice attenuatis liberis vel subadnexis.

Hab. On the ground. Sikkim. (Dr. Hooker.)

Pileus 2½ inches across, convex, very obtuse, fleshy, rough with large coarse pyramidal warts, which at length become corky. Stem 2 inches high, ⅓ of an inch thick, curved, sprinkled with a few large warts, slightly rooting, but not tuberous. Ring ample, deflexed. Gills attenuated behind. Acquiring a slight tawny tint in drying. Allied to *A. Vittadini*, but differing in its less stately habit, and in the stem having only a few very large warts.

* *A.* (Tricholoma) *subpulverulentus*, P.

Hab. On the ground, near Sassar, in Tibet, 16,000 feet. August 12, 1848. (Dr. Thomson.) Found also by Captain Strachey.

* *A.* (Collybia) *longipes*, Bull. t. 232.

Hab. Khasia Mountains. (Dr. Hooker.)

* *A.* (Pleuropus) *dryinus*, P.

Hab. On trees, near Avantipura, Kashmir. Dr. Thomson. May 4, 1848.

* *A.* (Pleurotus) *salignus*, P.

Hab. Sikkim. (Dr. Hooker.)

A single specimen only, about 7 inches across, with a slightly lobed outline. The gills are distinct at the base, and the very short stem is rather strigose.

* *A.* (Pleurotus) *petaloides*, Bull. t. 226, 557.

HAB. On dead wood, East Nepal. (Dr. Hooker.)

* *A.* (Hebeloma) *auricomus*, Batsch, f. 21.

HAB. On the ground at Karsar, in the Nubra Valley, Tibet. July 24, 1848. (Dr. Thomson.)

* *A.* (Flammula) *sapineus*, Fr.

HAB. Simla. August 27, 1849. (Dr. Thomson.)

* *A.* (Naucoria) *cerodes*, Fr.

HAB. Le and Valley of the Indus. July, 1848. (Dr. Thomson.)

Spores bright, of a pure golden-brown under the lens, $\frac{1}{1500}$ of an inch in diameter.

A closely allied species occurred at Karsar, in the Nubra Valley, July 24, 1848, with spores of an equally pure yellow, but only $\frac{1}{2500}$ of an inch long.

402. *A.* (Naucoria) *Khasiensis*, n. s.; pileo convexo subumbonato subcarnoso; stipite elongato flexuoso solido; lamellis latis ventricosis adnexis ochraceo-cinnamomeis. Hook. fil., Ic. Ser. 3, No. 7.

HAB. Khasia Mountains, amongst grass. Kala Panee, 5000 feet. June 28, 1850. (Dr. Hooker.)

Inodorous, brittle. Pileus $\frac{3}{4}$ of an inch broad, convex, subhemispherical with a minute umbo, fleshy, yellow, shaded with brick-red, dry; flesh yellow. Stem flexuous, 5 inches high, 1 line thick, yellow, solid. Gills ventricose, ochraceous-cinnamon, ascending, adnexed. Spores bright ochraceous, $\frac{1}{2500}$ of an inch long, subelliptic.

Resembling *A. cerodes* and *A. melinoides*, but distinguished by its solid stem, more fleshy pileus, and adnexed ventricose gills. It contracts prodigiously in drying.

403. *A.* (Psalliota) *fulviceps*, n. s.; totus fulvellus; pileo convexo obtusissimo floccoso-squamoso; stipite sursum attenuato transversim floccoso; annulo fugaciori medio; lamellis subangustis.

HAB. On the ground. Sikkim. (Dr. Hooker.)

Whole plant of a light tawny, inclining to rufous. Pileus $1\frac{1}{2}$ inch across, convex, very obtuse, broken up into floccose scales, sometimes all over, but occasionally at the apex only. Stem $1\frac{1}{2}$ inch high, $\frac{1}{4}$ of an inch thick, transversely floccose, attenuated upwards. Ring attached in the centre, rather fugacious. Gills not broad; spores minute, short, broadly subcymbiform, $\frac{1}{5000}$ of an inch long.

Resembling such *Lepiotæ* as *A. polysticta*. A very neat species.

* *A.* (Hypholoma) *fascicularis*, Huds.

HAB. Simla. August 27, 1849. Dr. Thomson.

* *A.* (Psathyrella) *gracilis*, Fr.

HAB. On the ground. Karsar in the Nubra Valley, Tibet. July 24, 1848. (Dr. Thomson.)

Spores $\frac{1}{2000}$ inch long, of a deep brownish-purple.

404. *Lactarius stramineus*, n. s.; totus stramineus; pileo carnoso infundibuliformi glabro; stipite subæquali obtuso, mycelio albo byssoideo; lamellis angustis. Hook. fil., Ic. Ser. 3, No. 34.

HAB. On the ground, alt. 5000 feet. Pomrang, Khasia Mountains. September 18, 1850. (Dr. Hooker.)

Of a beautiful pale straw-colour; pileus 2–3 inches across, smooth, infundibuliform, repand; flesh rather thick. Stem 1½–2 inches high, about ½ an inch thick, solid, smooth; mycelium white, consisting of delicate down. Gills scarcely a line broad.

Nearly allied to *L. piperatus*, but differing in its straw-coloured tint, smaller size, and greater delicacy. The figure was formerly referred to *L. vellereus*, in consequence of some unmarked specimens of that species which were supposed to belong to it. I do not find the gills branched.

* *L. princeps*, Berk.

An examination of the specimens shows No. 12 to be the old state of No. 16. In all, the pileus and stem are clothed with very fine velvety hairs.

405. *Lentinus Nepalensis*, n. s.; pileo infundibuliformi spongioso-velutino setis subfasciculatis hispido; stipite longo gracili dense setoso parcius spongioso-tomentoso; lamellis distantibus integerrimis pallidis glabris, basi cum stipite setoso confluentibus.

HAB. On dead wood. Nangki, East Nepal, alt. 9000 feet. November 13, 1848. (Dr. Hooker.)

Pileus 2½ inches broad, infundibuliform, thin, coriaceous, clothed with short dense pale spongy down, from which spring brown bristles singly or in fascicles; margin involute. Stem 3 inches or more high, scarcely ¼ thick, finely downy, like the pileus, especially at the base, and densely setose, the bristles reaching some way up the gills. Gills pale, smooth, distant, moderately broad, quite entire, acutely decurrent.

Resembling *L. Hookerianus*, but a more graceful plant, with broader and more distant gills. In *L. fasciatus* the bristles are paler, not deep brown, and the stem is rather inclined to be attenuated downward, besides being in proportion far shorter.

* *L. Lecomtei*, Fr.

HAB. East Nepal. (Dr. Hooker.) ' A single small specimen.

406. *L. prærigidus*, n. s.; fasciculatus; pileo excentrico umbilicato rigido squamuloso antice setoso, margine repando; stipite brevi-furfuraceo basi nigricante; lamellis latiusculis distantibus subintegris.

HAB. On dead wood. Soane River; Behar. (Dr. Hooker.)

Fasciculate. Pileus excentric, very rigid, umbilicate, clothed with short pale down, dotted with little scales composed of darker bristles, which towards the edge become a close tawny pile; border repand. Stem short, scarcely exceeding an inch in height, $\frac{1}{4}$–$\frac{1}{2}$ an inch thick, black at the base, furfuraceous, not rooting. Gills distant, decurrent, not anastomosing at the base or only very slightly, scarcely forked; extreme edge uneven, thin, but not strongly toothed.

A magnificent species, with the habit of *Lentinus Sajor-Caju*, and resembling at first sight some form of *L. tigrinus*. The gills in the dried specimen are umber. (TAB. VIII. fig. 1.)

407. *L. inquinans*, n. s.; pileo infundibuliformi spadiceo-velutino postice glabrescente, verrucis fuscis primum polygonis hic illic aspero, margine involuto; stipite duro subvelutino glabrescente, lamellis distantibus furcatis integerrimis setosis.

HAB. On dead wood, to which it adheres firmly. Mai Valley, East Nepal, alt. 5000 feet. November 7, 1848. Changachelling, alt. 7000 feet, Jan. Sikkim. (Dr. Hooker.)

Inodorous. Pileus 4–5 inches across, infundibuliform, clothed with short velvety brown pubescence mixed with bristles, at length smooth behind, slightly grooved when old, sprinkled with polygonal brown warts, which are more or less persistent to the last, though becoming gradually flatter; margin involute; juice staining the hands of a rhubarb-yellow colour. Stem $1\frac{1}{2}$–2 inches high, 4–5 lines thick, hard, woody, obscurely velvety, transversely scaly, the scales and pubescence running up to the very base of the gills and sometimes reflected there, as if originally forming a slight ring, and continued doubtless with the substance of which the warts are formed, perfectly solid, pale. Gills about two lines broad, distant, decurrent, but not very acutely, and continued only a short way down the stem, quite entire, forked once or twice, velvety with short dark bristles. The colour of the pileus and gills when dry is of a rich brown, varying here and there to rufous: I have no notes as to the original colour.

This is, perhaps, the most beautiful of all the *Lentini*, singular for its warty prominences and for its property of staining the hands. It resembles in some respects *Agaricus verrucarius*, the figure of which gives a good idea of it, if a velvety down mixed with short bristles be added on the edge. Where the velvety substance is worn off, the surface is quite smooth and shining. Old specimens somewhat resemble *Lentinus badius*, but the warty pileus is an evident distinctive character without entering on other points. In dried specimens a pellicle separates from the umbilicus, carrying the warts with it and leaving the pileus smooth. (Tab. VII. fig. 1.)

* *Panus*, sp.

Hab. On dead timber. Lahore. (Dr. Thomson.)

Pileus umbilicate; stem distinct, not hirsute. The specimens are not in a sufficiently good state to determine the species.

408. *Xerotus lobatus*, n. s.; brunneus; pileo reniformi tenui lobato pallescente; stipite laterali brevissimo albido-tomentoso vel obsoleto; lamellis distantibus, interstitiis lævibus subrugosisque, lamellulis subradiantibus.

Hab. On dead wood. Khasia Mountains. (Dr. Hooker.)

Chocolate-brown, solitary or imbricated. Pileus 1 inch or more broad, $\frac{1}{2}$–$\frac{3}{4}$ long, reniform, lobed, paler than the hymenium, thin, flexible, marked with lines answering to the gills. Stem extremely short, lateral, clothed with white down, or entirely obsolete. Gills distant, moderately broad, the smaller ones often radiating from the larger ones; interstices either even or slightly wrinkled.

In well-grown specimens the disposition of the smaller gills resembles that in *Agaricus radiatilis*, and gives a peculiar aspect to the species.

* *Schizophyllum commune*, Fr.

Hab. On dead wood. Paras Nath, Behar, alt. 3000 feet. (Dr. Hooker.)

* *Lenzites applanata*, Fr.

Hab. Sikkim; Leebong, alt. 6000 feet. (Dr. Hooker.)

* *L. repanda*, Fr.

Hab. East Nepal, 6000 feet. (Dr. Hooker.)

409. *L. ochrophyllus*, n. s.; pileo subreniformi crasso suberoso, disco orbiculari affixo albido subzonato glabrescente subnitido; lamellis latis crassis furcatis ochroleucis.

HAB. Sikkim, on dead charred wood. Darjeeling, alt. 7500 feet. (Dr. Hooker.)

Pileus 6 inches across, 3 long, subreniform, attached by an orbicular disc, corky, dirty white, at length smooth and slightly shining, ragged behind, marked towards the margin with a few zones; edge acute. Gills ¼ of an inch broad, thick, rigid, forked, ochraceous.

Resembling externally *Lenzites repanda*, but the gills are like those of *L. betulina*.

410. *L. eximia*, Berk. et Curt. MS.; pileo tenui rigidiusculo flabelliformi, disco orbiculari affixo umbrino glabro sericeo-nitido zonato; lamellis concoloribus furcatis repando-dentatis.

HAB. On dead wood. Sikkim; Darjeeling, 7500 feet. (Dr. Hooker.)

Pileus 3–4 inches broad, 2½ long, flabelliform, subdecurrent, fixed by a central disc, rather rigid, thin, smooth, shining with a silky lustre, umber, repeatedly and closely zoned; margin acute, often striate; substance thin, pale umber. Gills thin, repeatedly forked, broadly emarginate at each division, of the same colour as the pileus, often forming pores at the base; edge very acute.

This species agrees in many respects with *L. tricolor*, but it has not the bright colours of that fungus. The specimens from South Carolina are smaller, but identical. There is also some resemblance to *L. Klotzschii*, which has thicker gills and differently arranged.

* *L. pallida*, Berk.

HAB. On dead wood. Khasia Mountains. (Dr. Hooker.)

The specimens are young, and the lamellæ not yet formed.

* *L. acuta*, Berk.

HAB. Khasia Mountains, Nunklow, 4000 feet. July 12, 1850. (Dr. Hooker.)

A single specimen only.

411. *L. subferruginea*, n. s.; pileo flabelliformi apodo ferrugineo-gilvo adpresse subtomentoso antice zonato intus rhabarbarino; lamellis furcatis sublignosis.

HAB. On dead wood, Khasia Mountains. Moflong. July 2, 1850. (Dr. Hooker.)

Pileus 2 inches or more broad, 1½ inch long, rather thin, rigid, minutely adpresso-tomentose, reddish-grey, with a ferruginous tint, zoned in front; margin very acute. Substance ferruginous-yellow. Gills of the same colour as the pileus, rigid, moderately broad, forked.

The colours approach those of *L. sepiaria*, but the pileus is not at all scabrous. The habit is that of *L. striata*.

* *L. imbricata*, Fr.

HAB. Sikkim; Darjeeling. (Dr. Hooker.)

The specimens are old, and seem to be the same with authentic samples from Fries, but it is very difficult in this genus to form any judgment from old washed individuals.

* *Boletus furfuraceus*, Berk. in Hook. Journ. 1852, p. 137.

The pores are decurrent, so that the whole space above the ring is more or less reticulate. The spores are elongated, about $\frac{1}{3500}$ of an inch long.

412. *B. flavipes*, n. s.; pileo convexo pallide fusco-luteo; stipite incurvo cavo flavo-pulverulento; tubulis adnexis sordide flavis.

HAB. Khasia Mountains, on the ground. Myrong. July, 1850. (Dr. Hooker.)

Inodorous. Pileus 2 inches across, convex, dry, pale fuscous-yellow, of a firm but rather soft consistence. Stem $1\frac{1}{2}$ inch high, incrassated upwards, curved, hollow, clothed with a very thin bright yellow meal. Pores moderately long, rather large. Spores subelliptic, $\frac{1}{3500}$ of an inch long.

A pretty species, distinguished by its yellow hollow stem. The stem resembles that of *B. Ravenelii*, Berk. et Curt.

413. *B. pusillus*, n. s.; pusillus totus albidus; pileo convexo subhemisphærico puberulo; stipite deorsum incrassato; carne e flavo cæruleo. Hook. fil., Ic. Ser. 3, No. 2. *β*.

HAB. Khasia Mountains, on the ground. Moflong. June 29, 1850. (Dr. Hooker.)

Pileus 1 inch across, minutely downy, convex, subhemispherical. Stem incrassated below, $1\frac{1}{4}$ inch high, nearly $\frac{1}{2}$ an inch thick. Flesh yellow, changing to China indigo blue when cut. Pores moderately long, adnate. Dissepiments thick; edge obtuse. Spores elongated, $\frac{1}{2500}$ of an inch long.

Differing from *B. miltinus*, which it somewhat resembles in the pores being of the same colour as the pileus, and in its longer and more fusiform spores.

414. *B. verrucarius*, n. s.; pileo convexo crasso verrucis magnis spongiosis exasperato; stipite incurvo brevi; tubulis longis amplis subliberis.

HAB. On the ground. Sikkim. (Dr. Hooker.)

Pileus 3–6 inches across, convex, thick, disc tan-coloured, rough, with large thick warts. Stem incurved, $1\frac{1}{2}$–3 inches high, $\frac{1}{2}$–$\frac{3}{4}$ of an inch thick, rather incrassated at the base, nearly even. Pores long, large, rounded behind, nearly free. Spores dark yellow, brown, elongated, $\frac{1}{1250}$ of an inch long.

A magnificent species, remarkable for its warty surface, small stem, and large spores. It comes nearest to *B. gigas*, in which the surface is very different, and the spores are smaller.

* *B. areolatus*, Berk.

Spores minute, elliptic, $\frac{1}{4000}$ of an inch long. Stem truly reticulated in large specimens.

* *B. scrobiculatus*, Berk. l. c. p. 139.

Spores about $\frac{1}{2500}$ of an inch long, elongated. Old specimens have somewhat the appearance of *Strobilomyces*, but the spores are very different.

* *B. squamatus*, B. l. c. p. 137.

The spores in this species are of a bright ferruginous ochre, like those of *Cortinarii*, oblong, and about $\frac{1}{1600}$ of an inch long.

* *Strobilomyces nigricans*, B. l. c. p. 139.

Spores $\frac{1}{2000}$ of an inch long.

415. *Polyporus* (Mesophus) *nodipes*, n. s.; pileo carnoso umbilicato orbiculari subtiliter fuliginoso-flocculoso, margine involuto; stipite communi tuberoso nodoso; poris hexagonis mediis.

HAB. On the ground. Khasia Mountains. (Dr. Hooker.)

Pileus fleshy, growing three or four together from one common stem, orbicular, umbilicate, clothed with very minute brownish pubescence, paler in the centre, 3 inches or more across; margin involute. Common stem very short, continued from a knotty, cylindrical, erect, or oblique tuber, an inch or more thick, and two or three inches long. Pores pale, shallow, subhexagonal, middle-sized.

Allied to *P. subsquamosus*, but distinguished by its tuberous, knotty stem, absence of scales, etc. In an early stage of growth the pileus and decurrent hymenium form a turbinate mass; but, as the pileus expands, the hymenium becomes more distinct, and there is thus little or any real stem.

* *P. tabulæformis*, Berk. *P. spectabilis*, Fr. Nov. Symb. p. 32.

HAB. Sikkim, on dead wood. Darjeeling, alt. 7500 feet. (Dr. Hooker.)

This species is very near to *P. Schweinitzii*, but differs in the substance, not having any rhubarb tint, and in the pileus not being so rough. The South Caroline specimens exactly agree with those from the Himalayas. The name is applicable to the form which was first described, with a central stem; in the others the stem is lateral or obsolete.

* *P. obtectans*, Berk.

HAB. On the ground and on dead wood.

Khasia Mountains; Churra. Moflong, June 29, 1850. Nunklow, July, on clay banks. (Dr. Hooker.)

Varying considerably in habit, and in the size of the pores. The Nunklow specimens have a very slender stem, and may possibly be distinct, but unfortunately every individual is past its prime, and consequently the normal state of the pileus cannot be ascertained.

* *P. rugosus*, Nees.

HAB. Khasia Mountains. (Dr. Hooker.)

Stem nearly a foot high. Pileus distinctly zoned.

* *P. xanthopus*, Fr.

HAB. Banks of Soane River. (Dr. Hooker.)

416. *P.* (Mesopus) *florideus*, n. s.; pileo umbilicato subinfundibuliformi nitidissimo zonato, radiatim rugoso atropurpureo, margine lobato; stipite centrali vel excentrico luteo; poris minutis rotundis, acie obtusa.

HAB. On dead wood. East Nepal. Sikkim; Darjeeling, 7500 feet. (Dr. Hooker.)

Pileus 4 inches across, umbilicate, subinfundibuliform, of a rich purple, gradually becoming darker, polished, repeatedly zoned, marked with radiating lines or depressions; margin lobed. Stem not ½ an inch high, expanded above, yellow, lanate. Pores minute, ochraceous, about $\frac{1}{100}$ of an inch across, visible to the naked eye, round, edge obtuse, entire; margin of hymenium free.

This has the external appearance of *Pol. xanthopus*, but the pores are quite different.

* *P. squamosus*, Fr.

HAB. On dead wood. Sikkim; Darjeeling, 7500 feet. (Dr. Hooker.)

417. *P.* (Pleuropus) *versiformis*, n. s.; pileo carnoso lente suborbiculari excentrico umbilicato, primum subtiliter flocculoso-velutino umbrino-gilvo, demum glaberrimo castaneo-rufo, margine tenuissimo ex-

cedente; stipite nigro rugoso subreticulato glabrescente; poris decurrentibus parvis, acie tenuissima quandoque fimbriata.

HAB. On dead wood. Sikkim. (Dr. Hooker.)

Pileus 1–2 inches across, suborbicular, umbilicate, at first of an umber grey, slightly tinged with red, minutely velvety or flocculent, at length perfectly smooth but rugose, of a deep chestnut-red brown. Margin extremely thin, extending beyond the pores, at first flocculose beneath, but by no means ciliated. Stem $\frac{1}{2}$–1 inch high, 2 lines thick, black at first, downy like the pileus. Pores decurrent, but more so in the more excentric specimens, minute, about $\frac{1}{100}$ of an inch across, angular; dissepiments thin; edge very thin, sometimes denticulate, pallid.

Allied to *P. melanopus*, but differing in the very acute dissepiments, and more darkly coloured.

* *P. lucidus*, Fr.

HAB. Soane River. Behar, near Sulkun. Sikkim; Darjeeling, 7500 feet. (Dr. Hooker.)

418. *P.* (Pleuropus) *pudens*, n. s.; pileo laterali suborbiculari rugoso zonato stipiteque elongato e rhizomate cylindrico oriundo subtiliter fulvo velutino; substantia suberosa pallida; poris brevibus. Hook. fil., Ic. Ser. 3, No. 18.

HAB. In woods. Khasia Mountains; Myrong, 6000 feet. July. (Dr. Hooker.)

Pileus suborbicular, emarginate, $1\frac{1}{4}$ inch across, zoned, rugose, corky, thin, laterally affixed, brownish, clothed, as are the stem and rhizome, with a delicate velvety down. Stem 3 inches high, solid, flexuous, irregular, springing from a somewhat horizontal creeping rhizome, white within. Pores very shallow, round, nearly entire; hymenium tinged with pink and bordered with yellow.

A most distinct species, with the habit of *P. auriscalpium*, but with no very certain relation.

419. *P.* (Pleuropus) *vallatus*, n. s.; suberosus fulvo-rhabarbarinus; pileo laterali subspathulato vel flabelliformi velutino; stipite laterali tomento spongioso vestito; poris minutis; hymenio marginato obliquo.

HAB. On the ground. Khasia Mountains. (Dr. Hooker.)

Rather hard, corky. Pileus 2 inches high, 3 broad, spathulate or subflabelliform, zoneless or obscurely zoned, tawny, inclining to rhubarb-yellow, rugged, velvety. Stem 1 inch or more high, $\frac{1}{2}$ an inch or more thick, sometimes torulose, clothed with spongy down. Hymenium

oblique, bordered all round. Pores minute. Sometimes, in consequence of lateral confluence, several individuals combine into a cyathiform mass.

Allied to *P. tomentosus*, but harder, and with an essentially lateral stem. It is also allied to *P. spathulatum.*

420. *P.* (Pleuropus) *squamæformis*, n. s.; pileo reniformi brevissime stipitato tenui castaneo subtiliter virgato subzonato sericeo-nitido; margine tenuissimo subtus sterili, hymenio pallido; poris mediis postice dentato-elongatis.

Hab. On dead wood. Khasia Mountains. (Dr. Hooker.) A single specimen only.

Pileus $1\frac{3}{4}$ of an inch across, 1 inch long, reniform, with a very short disciform stem, wood-coloured, shaded with chestnut, and minutely virgate, subzonate, with a few slight radiating depressions, smooth, with a silky lustre. Edge extremely thin, barren beneath, hymenium pale. Pores $\frac{1}{48}$ of an inch across, dissepiments rather rigid, elongated behind into a sharp tooth.

This species had somewhat the aspect of *P. modestus*, but the hymenium is altogether different. No species can be more distinct. Tab. VII., fig. 2.

* *P. flabelliformis*, Klotzsch.

Hab. Sikkim; Leebong, 6000 feet. (Dr. Hooker.) No. 133.

421. *P.* (Merisma) *flammans*, n. s.; pileo convexo subtiliter tomentoso contextuque crasso igneo; stipite nullo; hymenio flavo; poris mediis brevibus. Hook. fil. Ic., No. 10.

Hab. On dead wood. Sikkim; Darjeeling, 7500. (Dr. Hooker.)

Pilei 5 inches across, 2 inches long, flocculent, convex, imbricated, bright flame-coloured, as is also the thick substance. Edge acute. Pores yellow, here and there tinged with red, short, middle-sized.

The substance splits in drying, and becomes of a deep yellowish umber, as does the whole fungus. I do not understand the affinities of this species. Its colours are those of *P. sulfureus*, but it is not closely allied to it.

* *P. adustus*, Fr.

Hab. Sikkim Himalaya, 7000 feet. (Dr. Hooker.)

422. *P.* (Anodermei) *digitalis*, n. s.; pileo carnoso lente tenui digitaliformi vertice affixo subzonato subvelutino ochraceo; hymenio concolore; poris minutis angulatis; acie subintegra.

HAB. On dead wood. Sikkim; Darjeeling, 7500 feet. (Dr. Hooker.)

Pileus $1\frac{1}{2}$ inch or more broad and long, thin, digitaliform, with the aperture expanded, slightly zoned, velvety, or clothed with matted down, ochraceous. Edge extremely thin and acute; hymenium even, of the same colour as the pileus. Pores minute, shallow, angular, about $\frac{1}{130}$ of an inch across. Edge nearly entire.

This has to the eye the appearance of a variety of *Stereum lobatum*. The form is essentially digitaloid, the young pilei appearing like almond-shaped sacs: I have seen nothing like it before. *Cellularia cyathiformis*, Bull. t. 414, expresses in some degree its habit.

* *P. funalis*, Fr.

HAB. Soane River. (Dr. Hooker.)

Authentic specimens vary from ferruginous to pale tawny. The Indian specimens are very pale.

423. *P.* (Anodermei) *vivax*, n. s.; pileo subflabelliformi e planta annotina redivivo scabro subtomentoso zonato, margine demum resinoso; poris parvis, acie acuta sublacera.

HAB. On dead wood. East Nepal. (Dr. Hooker.)

Pileus 1 inch or more broad, $1\frac{1}{4}$ or more long, fixed by the vertex, at first subtomentose, white, scabrous, more or less zoned; margin acute, at length resinose. Pores minute, $\frac{1}{96}$ of an inch broad, dissepiments rather thin. Edge acute, at length minutely toothed.

The old plant becomes black, and quite smooth and shining, with well-marked zones.

Allied to *Pol. borealis*, but very distinct.

424. *P.* (Anodermei) *Elatinus*, n. s.; pileo reniformi vertice elongato glabro radiato-rugoso vernice tenui ochroleuco vestito; contextu albo; poris minutis angularibus irregularibus.

HAB. On pine. East Nepal and Sikkim. (Dr. Hooker.)

Pileus 2 inches or more across, $1\frac{1}{4}$ or more long, subreniform, with the vertex elongated, but attached for some distance, finely wrinkled, covered with a thin shining ochroleucous coat, but scarcely decidedly laccate, substance white, tolerably firm. Pores long, white within, minute, about $\frac{1}{130}$ of an inch across, irregular.

I find nothing allied to this. It seems rather to belong to the Anodermous than the Placodermous group.

425. *P.* (Placodermei) *medullaris*, n. s.; pileo amplo gibbo brevissimo laccato, margine obtusissimo recto zonato; poris parvis angulatis, acie obtusa.

HAB. On dead wood. Behar. (Dr. Hooker.)

Pileus 7 inches across, 4 inches long, $2\frac{1}{2}$ thick, gibbous, subdimidiate, covered with a thin, yellow or reddish, laccate coat; substance thick, white, extremely light; margin very obtuse, abruptly perpendicular, zoned and striate. Pores rather deep, $\frac{1}{50}$ of an inch across, angular; edge obtuse, entire.

Allied to *P. portentosus*, but distinguished by its larger pores, zoned and striate, sulcate margin, distinctly laccate coat, etc. It is also analogous to *P. ochroleucus*, Mont., but is far lighter and more thinly laccate, besides belonging to the *P. betulinus* alliance, and not to that of *P. fomentarius*.

* *P. australis*, Fr.

HAB. On wood. Eastern Nepal and Khasia Mountains. (Dr. Hooker.)

* *P. fomentarius*.

HAB. On dead wood. Khasia Mountains and Sikkim; Darjeeling. (Dr. Hooker.)

Besides the common European form, there is a large ungulate state. This species grows to an enormous size on Poplars in the more Northern Himalaya.

426. *P.* (Placodermei) *adamantinus*, n. s.; durissimus; pileo subflabelliformi explanato zonato demum glabro crusta dura obtecto; contextu primum rhabarbarino demum umbrino; poris stratosis minutis subrotundis subconcoloribus.

HAB. On dead wood. Khasia Mountains and Sikkim; Darjeeling. (Dr. Hooker.)

Extremely hard and rigid. Pileus 4 inches broad, expanded, thin, subflabelliform, at first yellowish, and most minutely pubescent, soon becoming quite smooth, dark brown, sulcated and repeatedly and narrowly zoned, covered with a thick rigid crust; substance rhubarb-coloured, acquiring at length an umber tint. Pores minute, subrotund, yellowish-umber.

This very distinct species has the habit of the Ceylon *P. ferreus*. In general it is about $\frac{1}{4}$ or $\frac{1}{2}$ inch thick, but specimens occur which are ungulate, bearing some resemblance to *P. igniarius*. The thin forms are however the more normal. The base of the pileus is often prolonged into a spurious stem.

* *P. igniarius*, Fr.

Hab. On dead trees. Sikkim; Darjeeling. (Dr. Hooker.)

A small form with the pileus slightly arched, and a larger variety regularly grooved or torulose.

* *P. senex*, Nees et Mont.

Hab. On dead trees. Khasia Mountains and Sikkim; Darjeeling. (Dr. Hooker.)

Exactly according with the Ceylon specimens, and with others from Brazil. The Cuba plant is rather thinner, and that from South Carolina has rather larger pores. The old specimens look very much like the lumps of iron ore which occur in ferruginous limestone districts. Young quickly grown specimens, with the pileus deeply and regularly sulcate, are very pretty.

427. *P.* (Placodermei) *endophæus*, n. s.; durissimus, pileo dimidiato-decurrente rigido rugoso toruloso subvelutino; contextu nigro-purpureo; poris minimis stratosis.

Hab. On dead wood. Khasia Mountains. (Dr. Hooker.)

Extremely hard and ponderous. Pileus 1 foot or more across, 4 inches long, decurrent behind, reflected in front, marked with a few deep furrows, and very rugged and uneven, at first somewhat velvety: substance dark purple-brown. Pores minute, stratose, but with layers of the pileus interposed.

A very distinct species, remarkable for its hard, dark-brown substance, resembling exactly in colour *Geranium phæum;* this is beautifully zoned, especially where it is attached to the wood.

* *P. marginatus*, Fr.

Hab. On dead trees. Khasia Mountains and Sikkim. (Dr. Hooker.)

428. *P.* (Placodermei) *Thomsoni*, n. s.; suberosus; pileo angulato-deformi sulcato rugoso postice decurrente laccato; contextu pallide ligneo; poris mediis, acie obtusiuscula subintegra.

Hab. On trunks of trees, probably of Pine. Simla, Dr. Thomson.

Corky, ponderous. Pileus 12 inches across, 4 inches long, obliquely ungulate, decurrent behind, deeply sulcate, rugose, covered with a resinous, red, laccate coat, which is in parts minutely wrinkled, and occasionally cracked so as to expose the pale, wood-coloured, corky substance, which is very faintly zoned. Hymenium concave, wood-coloured. Pores about $\frac{1}{35}$ of an inch across, round or slightly angular, sometimes elongated; dissepiments rather thick; edge rather obtuse, nearly even.

This is closely allied to *P. marginatus*, but the pores are very much

larger, so as to make it impossible to refer it to that species. Within what limits it may vary it is impossible to say, as there is only a single, but magnificent specimen. The appearance of the hymenium is very much that of *P. annosus.*

429. *P.* (Placodermei) *scopulosus*, n. s.; durus suberosus; pileo subflabelliformi vertice affixo albido glabro zonato rugoso; hymenio coffeato; poris punctiformibus, acie obtusa.

HAB. On dead wood. Sikkim; Darjeeling. (Dr. Hooker.)

Pileus 5 inches across, 2 inches long, but often larger from confluence, hard, woody, dirty white, repeatedly zoned, more or less rugged, smooth, almost black at the very base; substance dark wood-coloured, or umber; edge rather acute, very slightly lobed; hymenium concave, coffee-coloured. Pores minute, $\frac{1}{100}$ of an inch across, punctiform; edge obtuse, entire.

Allied to *P. Valenzuelianus*, Mont., but with a very different pileus.

430. *P.* (Placodermei) *semitostus*, n. s.; suberosus, pileo dimidiato tenui lato, margine lobato, opaco subglabro, antice ligneo-pallido postice fusco-tincto sulcato zonato, hymenio pallido, poris minutis stratosis punctiformibus.

HAB. On deal wood. Khasia Mountains. (Dr. Hooker.)

Perennial, imbricated, hard and corky, slightly flexible. Pileus a foot across, 4 inches or more long, opake, scarcely subtomentose, sulcato-zonate, inclined to divide at the zones in front, pale wood-coloured, stained behind with brown. Substance pale. Hymenium wood-coloured, bordered all round and showing marks of several seasons. Pores short, punctiform, $\frac{1}{140}$ of an inch across, truly stratose.

Resembling *Polyporus tostus*, but in that species the pores are very much larger. It belongs to the same group with *P. fraxineus*, etc.

(*To be continued.*)

Short Characters of three new ALGÆ *from the Shores of Ceylon, by* W. H. HARVEY, M.D., M.R.S.A., etc.

(With two Plates, TAB. V., VI.)

Among the marine *Algæ*, perhaps none are more curious and few more beautiful than those net-like or lacework *Florideæ* of which several genera, as *Claudea*, *Dictyurus*, *Martensia*, *Hanowia*, *Halophlegma*,

Thuretia, etc., have been discovered in the warmer seas. Of these, *Dictyurus* alone (which is common in Ceylon) has hitherto been recorded as inhabiting the Indian Ocean, it having been found by Belanger, and afterwards by Dr. Wight, near Cape Comorin; the rest, with the exception of *Halophlegma*, which has a West Indian species, having been supposed to be confined to the Southern Ocean, and chiefly to the shores of Australia.

I have now the pleasure to introduce to botanists, from the south coast of Ceylon, not only new species of *Claudea* and of *Martensia*, but also to add to this interesting group a new genus, which yields to none of its associates in beauty and delicacy of structure. This genus I wish to dedicate to John Van Voorst, Esq., F.L.S., the well-known Natural History publisher, who, though not himself a working naturalist, is a notable instigator of work in others, and, as the originator of a noble series of Monographs illustrating the Natural History of Great Britain, deserves the respect and thanks of his countrymen. The crest of the Van Voorsts (a family of no mean standing in Holland) is a *mermaid*, from whose toilet the exquisitely delicate lacework now to be described may have been stolen; and I have peculiar pleasure in associating with so charming a sea-plant the name of a friend for whom, personally, I have a cordial regard and esteem.

Vanvoorstia, *Harv.* (nov. gen.)

Frons explanata, varie lobata, decumbens, facie inferiore radiculis adhærens, reticulatim clathrata. *Reticulum* ex costis costulisque cellulosis compresso-planis iteratim secunde ramosissimis verticaliter anastomosantibus formatum. *Ceramidia* ovata, in reticulum sessilia, sparsa, intra pericarpium membranaceum, poro pertusum, *sporas* pyriformes e placenta basali egredientes, pedicellatas foventia. *Tetrasporæ* subbiseriatæ, in trabeculis ultimis reticuli immersæ.—Alga *elegantissima, gregaria, algas varias prorepens, livida, siccitate læte purpurea; substantia recentis cartilaginea, rigida, fragilis, mox in aqua dulci emolliens et in gelatinam deliquescens.* Structura *laxe cellulosa.*

1. Vanvoorstia *spectabilis*. (Tab. V.)

Hab. Growing on corallines and various small algæ in rock-pools, on a coral bank, in 2 or 3 feet water, three miles west of Belligam, south coast of Ceylon; November, 1853.—*W. H. H.*

Fronds 1–2 inches broad, decumbent, the margin ascending, crowded

together and affixed (in the manner of a foliaceous lichen) one to another by root-like processes. *Network* formed of cellular, compressed, cartilaginous membranes, which are somewhat midribbed and branched excessively in a repeatedly secund manner, the branches and their divisions successively anastomosing. *Conceptacles* scattered over the frond. *Tetraspores* immersed in the ultimate ramifications of the network, which are then swollen in the fertile portion. *Colour* livid, greenish-purple when growing, brilliant purple when dry. It rapidly decomposes in fresh water.

As a genus, *Vanvoorstia* will stand nearest to *Claudea*, from which it differs chiefly as *Nitophyllum* does from *Delesseria*.

Fig. 1. Portion, *magnified*. 2. Fertile portion, *more magnified.*

2. Claudea *multifida*, Harv.; caule brevi subsimplici, foliis junioribus cuneatis hinc crenatis, adultis flabelliformibus dichotomo-multifidis, margine ciliato-dentato, ceramidiis subsessilibus ovatis. (Tab. VI.)

Hab. In rock-pools, among sand, chiefly in the shelter of the larger algæ, in two or three feet of water six miles west of Belligam, south coast of Ceylon; November, 1853.—*W. H. H.*

Stem half an inch to an inch long, with one to three or four leaves. The very young leaf is in shape like the old Irish harp; a little afterwards it becomes cuneate, and crenate along the upper edge; the crenatures gradually lengthen into lobes, which are afterwards forked, and the full-grown leaf is fan-shaped and multifid. The structure is exactly as in *Claudea elegans.*

Fig. 1. Portion of a frond, *magnified*. 2. Fertile portion, *more highly magnified.*

3. Martensia *fragilis;* frondibus in cæspitem globosum densissime aggregatis fragilibus tenuissimis multifidis, lobis obtusis adultis apice clathrato-fimbriatis.

Hab. Cast ashore, Belligam Bay, Ceylon; Nov. 1853.—*W. H. H.*

Much more delicate and fragile in substance than *M. elegans*, and more decidedly lobed. The tufts resemble in shape and structure those of *Melobesia agariciformis*. The innumerable fronds cohere together by their faces for half their length, and cannot be separated without laceration. In fresh water the plant instantly turns orange, and rapidly breaks up.

Report of a JOURNEY OF DISCOVERY *into the Interior of* WESTERN AUSTRALIA, *between 8th September*, 1848, *and 3rd February*, 1849; *by* J. S. ROE, ESQ., Surveyor-General.

(*Continued from p.* 123.)

On the 28th of November, the horses having been sufficiently recruited, and all practicable repairs effected in our clothes and appointments, we commenced our return, passing from one to another of various hills, composed of granite and gneiss, which we had noticed from the interior, and generally finding around them sufficient grass and water for our purposes. Grass-trees and *Zamiæ* were again met with at less than twenty miles from Russell Range, as also the kangaroo, which afforded us a welcome relief from our long-salt diet.

The soil of the country we now traversed was generally of a light sandy character, but it improved as we proceeded westward, and encountered the novelty of numerous open fresh lakes, rushy lagoons, and abundance of fresh water, in a country lying low and level. Clumps of Yeit-trees scattered about it afforded our horses abundance of grass; and we had the satisfaction of seeing them improve daily in spirit and condition, for the country was once more open and accessible, and gave us reason to hope that all formidable scrubs had been finally left behind. Fragments of limestone, of oolitic formation and variegated colours, were in many places abundantly scattered over the surface; and the same rock frequently formed the basis of the low rocky ridges which traversed the level country between the granite hills. The latter were usually bare naked masses of close solid granite or gneiss, 300 to 500 feet above the surrounding plains, from which a sloping platform ascended for half a mile to the base of the bare rock. These hills frequently presented the extraordinary appearance of deep yawning rents or fissures, three inches to a foot in width across their entire breadth, some being open, but the greater part filled up with loose stones and rubbish. The rock itself was too compact and solid to exhibit much dip or stratification; but wherever any such were observable, the dip seemed to be to the S.S.E., at an angle of 20° from the vertical. We found occasion also to observe more than once that the huge masses of rock of which these hills were composed had from some unknown cause, probably subterranean, undergone a complete and violent disruption; and that, whilst one end of a mountain-mass would be piled

up in a confused heap of immense boulders, its opposite extremity would repose in broad smooth sheets of almost unbroken rock. Whether these appearances have been occasioned by subterranean fire, or merely exhibit the wreck of once lofty peaks, I feel unable to say;—such hills had evidently in former ages been of considerably greater dimensions. Those met with on the eastern part of our journey could never be relied on for affording feed for our horses.

On 2nd of December, having reached a lofty and remarkable granite hill, fifty miles S.W. of the Russell Range, which I had the honour to name Howick Hill, in reference to the talented nobleman at the head of Colonial affairs, we were then twenty-five miles abreast of Mount Ney, and I determined on sending to bring in our valued horse from thence, if found alive and able to travel. Accordingly, Messrs. Ridley and Gregory, who had volunteered the service, were despatched to Mount Ney, on the two best horses we had, while I conducted the party to some grass and water we had passed in a low swamp three miles back, the country for many miles round being tolerably level, and covered with very thick prickly scrub, knee-high, closely matted, and difficult to get through. Large clumps of *Nuytsia floribunda* (cabbage-tree) mixed with *Melaleuca* (tea-tree), both of stunted and gnarled growth, were now scattered about, and formed the nearest approach to timber we had seen for 350 miles. Stagnant water was plentiful, but the grass was very scarce, wiry, and coarse. The total failure of even this supply obliged me on the 4th to remove the horses to another and more grassy spot, which we had discovered in our rambles, two miles further to the S.W.; and I should gladly have moved the entire camp also, had I not feared our absent companions might thereby miss us altogether, had they travelled after dark to rejoin us. The necessity for shifting our camp was however becoming urgent, for, independent of the grass and feed being closely eaten off, one by one of our little water-holes had dried up, leaving half a bushel of tadpoles an inch long at the bottom; and our bowels and limbs were affected by our unhealthy low situation. Intending to leave a memorandum of our whereabouts, we were preparing to start from this residence of fever and ague while we had the power to do so, when, to our great joy, the absentees returned late in the day, with Ney in company. His respite of fifteen days had improved him wonderfully, though he still gave too abundant evidence of continued weakness, but this I trusted some indulgence

would overcome. During our stay at the camp the weather was too cloudy to admit of my obtaining any astronomical observations beyond what enabled me to ascertain that the variation was only 0° 12′ W. Mosquitoes and large biting flies were exceedingly abundant and troublesome.

On the 5th we gladly moved westward once more, the horses much recruited by the respite they had been afforded, and by the attention we had been enabled to bestow on their sore backs.

No material alteration took place in the face of the country. It continued nearly level, but with slight undulations or low limestone ridges, amongst which were many small fresh lakes, with occasional small clumps of yeit, affording good grass and water.

On the 7th we were abreast of Esperance Bay, and encamped at the foot of a high granite hill, fifteen miles north from Cape le Grand, from the summit of which a crowd of lofty granite islands and rocks were observed to rise abruptly out of the sea, together with some covered rocks and reefs, which will render great caution necessary on the part of vessels frequenting the Bay. The shore of the latter is sandy for several miles back, and numerous lakes, apparently salt, were observed to lie behind its northern beach. Around our camp were many huts and recent fireplaces of the natives; and large smokes were curling up three or four miles to the westward, showing the country to be somewhat better peopled. This hill, being a very remarkable object at a distance of nearly forty miles, I named Mount Merivale, after one of the Under-Secretaries of State for the Colonies; and a similar hill fifteen miles to the eastward, Mount Hawes. While taking a round of angles from the summit of the former, Mr. Ridley, who was breaking off samples of the rock, discovered in one of a very white formation, some remarkable veins and streaks of a light blue colour, which led to further examination, and to our quarrying to as great a depth as we could penetrate with the best tools in our possession. All our sanguine hopes of copper however fell to the ground, by finding, on our return to the camp, that the best specimens would not respond to the established tests.

To the west of Mount Merivale we crossed several streams of brackish water, running in shallow channels, from one to twenty yards wide, towards the lakes behind Esperance Bay. These were the first watercourses we had met with for four hundred miles; the surface-

water of the country, where occurring at all, being found in holes amongst the granite rocks, in small rushy lagoons or open lakes, and occasionally in lodgments in the more clayey descriptions of soil amongst the thick scrubs of the interior. In the latter situations were also frequently seen many circular spaces, five to ten yards in diameter, in which the interior rain-waters had subsided, and which answer to the description of Dr. Leichardt's "Melon holes." From this time, until we arrived abreast of the western group of the Recherche Archipelago, salt-lakes were of common occurrence immediately behind the sea-coast hills, and yielded the only food for our horses which this part of the country was likely to afford us; nor was this at all abundant or easily discovered on the route I pursued. Mr. Eyre had in 1841 generally found abundance both of water and grass for his horses hereabouts, immediately behind the coast-hills; but I was desirous of avoiding all former tracks as much as possible; and with respect to the nature of the country further inland, some natives we fell in with gave me to understand that nothing was to be met with there but scrub and salt-lakes.

On the 10th we had, in search for grass, so worked our way amongst numerous salt and fresh lakes and swamps, and the narrow ridges of steep limestone hills which divided them, that it was not without some difficulty we extricated ourselves next day, and gained the less intricate country which bordered them on the north. The travelling however was bad, and very trying to our weary horses, both on account of the steepness of the ridges, and their rocky rugged nature. We were therefore not sorry to find grass increase as we proceeded over more accessible slopes, and that in one patch it was of excellent quality to the extent of three hundred acres. Hopes being raised, toil no longer felt oppressive, and before noon we were once more gladdened by the sight of an open deep river, fifteen yards wide, extending directly across our course. Clumps of *Nuytsiæ* and Yeit were scattered about, *Zamiæ* of gigantic size grew near the steep banks, and tolerable grass among dwarf grass-trees extended back from two to four hundred yards. Numerous ducks and black swans were constantly disturbed as we ascended the river in its course to the northward, but we found to our regret that the bed rapidly diminished in importance. At first the banks were frequently broken into steep yellow and red cliffs, indicating a proximity to the coal formation; but these gradually disappeared,

and in less than three miles the narrow rocky bed was composed entirely of granite or gneiss, and the water in it was still brackish. The soil is a light sandy loam. The day being warm and oppressive, with a land-wind from the N.W., and the thermometer at 104° in the coolest spot I could find, I took advantage of fresh water being obtainable in the tributaries and swamps of this vicinity, and halted until three o'clock amongst good grass in a clump of Yeit-trees. As we had expected, a thunder-storm began to brew in the N.W., and it came on so rapidly, that before we could secure ourselves in another camping-place which we had taken up for the night, it burst with great violence and completely drenched us. Next day we traced this stream upwards to the total distance of thirteen miles N.N.E., when, finding it took us too much to the eastward, and that the grass in its neighbourhood had considerably diminished in quantity, I left it coming from the N.E. in several branches, the valleys of which were narrow, but grassy, and drained extensive elevated plains of a poor and worthless character. Its mouth is near the spot where Captain Flinders records on his chart there is "a white streak in the said hills;" and on its banks we occasionally observed some rich and very good soil. Kangaroos were abundant, and we frequently noticed traces of men; but our only dog was so pitiably foot-sore as to be quite incapable of catching anything, nor could he be induced to wear, even for ten minutes, the various leather boots we made for his relief. Naming this river the Gage, we quitted it about sixteen miles from the coast, and crossed a western branch as we steered westward, over open scrubby downs, drained by small watercourses or lakes, containing either salt or brackish water. After a harassing march of twenty-two miles, we were fortunately enabled to encamp on the 12th, amongst tolerable feed on the borders of a lake, perfectly fresh, and about three-quarters of a mile in diameter.

Five miles further westward, over similar country, brought us to the abrupt rocky banks of another river, with a samphire bed seventy or eighty yards wide, in which were pools of salt water, twenty yards by six or seven, but not a vestige of grass. As no inducement presented itself for following this river up to the N.N.W., I proceeded at once down its bed to the south-westward, soon came to good grass, where the banks opened out, and in less than three miles encamped in the midst of abundance of it, and of drinkable water, at the junction of several branches, some of which were observed to have cut their way

through white, yellow, and red cliffs. While the horses took the benefit of their early halt, I minutely examined the cliffs and their vicinity, in company with Mr. Ridley; but although there was every appearance of their forming a portion of the carboniferous series, we could discover no shales, nor any rocks in which could be traced a decided dip or inclination of the strata. In the evening the latitude by Meukar was found to be 33° 44′ 8″ S.

(To be continued.)

BOTANICAL INFORMATION.

First General Report of the Government Botanist, DR. F. MÜLLER, *on the* VEGETATION OF THE COLONY OF VICTORIA, in Australia; *communicated by His Grace* the Duke of Newcastle, *Chief Secretary for the Colonies.*

(*Continued from p.* 126.)

That the vegetation of the southern parts of our province accords greatly with the Tasmania Flora, may be demonstrated by the fact that more than half of all the enumerated species are known to inhabit Van Diemen's Land, amongst them many of great interest, which had been considered as belonging exclusively to that island, some adding even new genera to the Flora of New Holland: they are *Fagus Cunninghami, Bauera Billardieri, Tasmania aromatica, Weinmannia biglandulosa, Pleurandra monadelphia, Ranunculus Gunnianus, Capsella australis, Pittosporum bicolor, Rhytidosporum procumbens, Rhytidosporum Stuartianum, Boronia dentigera, Eriostemon verrucosus, Corræa Backhousiana, Meionectes Brownii, Bossiæa horizontalis, Brachycome decipiens, Celmisia astelifolia, Scævola Hookeri, Monotoca lineata, Lissanthe montana, Lissanthe ciliata, Prostanthera rotundifolia, Myosotis suaveolens, Wilsonia Backhousii, Gentiana Diemensis, Sebæa albidiflora, Hakea microcarpa, Podocarpus montana, Phyllanthus Gunnii, Micranthea hexandra, Diplarrhena Moræa, Uncinia tenella, Triodontium Tasmanicum,* and a great number of Ferns.

No numerical comparison with the Flora of South Australia and New South Wales has been instituted, as those localities are not sufficiently examined which bear, perhaps in this respect, so great a re-

semblance to the adjacent colonies as the southern tract of this province bears to Van Diemen's Land.

Still, there remains yet a considerable number of plants which impress on our vegetation a type of peculiarity; and I may be permitted, for this reason, to call attention to our remarkable species of *Panax*, resembling mainly those of the Moluccas; to *Trigonella suavissima*, as the only Australian Clover; to the species of *Psoralea* and to *Crantzia*, as connecting links with the American Flora; to *Pseudomorus Australasica*, the indigenous Mulberry-tree; to *Myrsine Howittiana*, more nearly connected with the New Zealand species than with those of New South Wales; and to the Alpine *Anisotome glacialis*, as a genus from Auckland and Campbell's Islands.

With regard to the *Phytogeographia* of this country, it may be deemed worthy of notice that, in the arid steppes beyond the Glenelg River, the vegetation undergoes a remarkable change; and a large number of such plants as are common to Victoria, New South Wales, and Van Diemen's Land, cease to exist, not even re-appearing further to the westward, where the physical character of the country assumes once more equality or similarity to the eastern provinces. Others, again, extend the geographical limits of certain genera or species which we thought to belong entirely to Western Australia; thus, for instance, *Thomasia petalocalyx* and *Coleostylis Preissii* range to the 148th meridian.

It may also be worthy of remark, that the Order of *Leguminosæ* prevails decidedly here, as in Western Australia, over all others; and that the *Compositæ*, far exceeding in South Australia, and almost throughout the world, any other groups, rank here as the second order. Both, taken together, show such eminent richness as to comprise nearly a fourth of all Dicotyledonous plants. The most predominant Natural Orders exhibit here, with regard to their number of species, the following series:—*Leguminosæ, Compositæ, Myrtaceæ, Algæ, Filices, Cyperoideæ, Gramineæ, Musci, Proteaceæ, Orchideæ, Epacrideæ, Fungi, Umbelliferæ, Diosmeæ, Liliaceæ, Lichenes, Labiatæ, Goodeniaceæ, Scrophularinæ*, and *Salsolaceæ.*

Finally, and perhaps as to the most important point of my researches, I have to notice the practical usefulness of our vegetable creation, either with regard to medicine, manufactures, or in a domestic point of view.

The inestimable truth, that we may safely calculate on the closest affinities of the medicinal properties of plants with their natural alliances—a truth which achieved the most complete triumph of the Natural System over all artificial classifications—has generally guided me in tracing out which plants might be administered in medicine. By this guidance I observed, that our *Pimeleæ* are pervaded by that acridity for which the bark of *Daphne Mezereum* is employed; that our *Polygala veronicea*, the only described Australian species of a large genus, and in close relation to one lately discovered in the Chinese empire, not only agrees, like some kinds of *Comesperma*, with the Austrian *Polygala amara*, in those qualities for which that plant has been administered in consumption, but also participates in the medicinal virtue of *Polygala Senega*, from North America. *Gratiola latifolia* and *Gratiola pubescens*, *Convulvulus erubescens*, and the various kinds of *Mentha*, are not inferior to similar European species. The bark of *Tasmania aromatica* appears to me to possess the medicinal power of the *Wintera* bark, gathered from a similar tree in Tierra del Fuego; and its fruit is allied to that of the North American *Magnoliæ* used in cases of rheumatism and intermittent fever. The whole Natural Order of *Goodeniaceæ*, with the exception, perhaps, of a few species, contains a tonic bitterness never recognized before, and discernible in many plants in so high a degree, that I was induced, for this reason, to bestow upon a new genus from the interior the name of *Picrophyta*; this property, which indicates a certain alliance to *Gentianeæ*, deserves the more consideration, as the true *Gentianeæ* are so sparingly distributed through Australia, while the *Goodeniaceæ* form everywhere here a prominent feature in the vegetation. Our Alps, however, enrich us also with a thick-rooted Gentian (*G. Diemensis*), certainly as valuable as the officinal *Gentiana lutea*; and in the spring, *Sabæa ovata*, *Sabæa albidiflora*, and *Erythræa australis*, might also be collected on account of their bitterness. The bark of the Australian Sassafras-tree (*Atherospermum moschatum*) has already obtained some celebrity as a substitute for tea: administered in a greater concentration, it is diaphoretic, as well as diuretic, and has for this reason already been practically introduced into medicine by one of our eminent physicians. *Isotoma axillaris* surpasses all other indigenous *Lobeliaceæ* in its intense acridity, and can be therefore only cautiously employed instead of *Lobelia inflata*. The root of *Malva Behriana* scarcely differs from that of *Althæa officinalis*, and the Salep-root might be collected

from many *Orchideæ*. Few may be aware that the Cajeput-oil of India is obtained from trees very similar to our common *Melaleucæ;* and that even from the leaves of the *Eucalypti* an oil can be procured of equal utility. The Sandarac, exuding from the *Callitris* or Pine-tree, the balsamic resin of the Grass-trees, and, moreover, the *Eucalyptus* gum, which could be gathered in boundless quantities, and which for its astringent qualities might here at least supersede the use of kino or catechu, will probably at a future period form articles of export.

Several *Acaciæ* are of essential service, either for their durable wood, or for the abundance of tannin in their bark, which has rendered them already useful, or for their gum; but the latter is even excelled in clearness and solubility by that obtained from *Pittosporum acacioides.* This species, as well as many other plants of the same Order, is distinguished by a surprising yet apparently harmless bitterness—a quality that warrants our expecting considerable medicinal power, and which deserves so much more attention, as till now we know nothing of the usefulness of the *Pittosporeæ*, although this Order extends over a great part of the eastern hemisphere.

The Australian Manna consists in a saccharine secretion, condensed chiefly by the Cicades from a few species of *Eucalypti*, but is chemically very differently constituted to the *Ornus* Manna, and much less aperient. All our splendid *Diosmeæ*, a real ornament to the country, approach more or less in properties to the *Buckus* of South Africa.

Bæckea utilis, from Mount Aberdeen, might serve travellers in those desolate localities as tea, for the volatile oil of its leaves resembles greatly in taste and odour that of lemons—not without a pleasant, peculiar aroma. *Trigonella suavissima* proved valuable as an antiscorbutic spinach in Sir Thomas Mitchell's expedition; and the *Tetragonella implexicoma*, the various *Cardamines*, *Nasturtium terrestre*, and *Lawrencia spicata*, may likewise be used for the same purpose. The root of *Scorzonera Lawrencei*—a favourite food of the natives—would form, if enlarged by culture, an agreeable substitute for *Scorzonera Hispanica*, or Asparagus; and *Anisotome glacialis*—a large-rooted Umbelliferous plant, from the snowy top of Mount Buller—will be added perhaps hereafter to the culinary vegetables of the colder climates. Seeds of the latter plants have been procured for the Botanic Gardens. *Santalum lanceolatum*, *Mesembryanthemum æquilaterale*, *Leptomeria pungens*, and *Leptomeria acerba*, deserve notice for their agreeable fruit.

It would lead too far to enumerate the numerous modest, but lovely, or even the more attractive ornamental plants, which will no doubt hereafter contribute to adorn the gardens here and at home. Still, in a general sketch of our vegetation, I ought not to pass unmentioned, in this regard, the magnificent *Grevillea Victoriæ;* the splendid parasite of the Fern-tree, *Basileophyta Friderici-Augusti*, on which the name of the royal botanist has been bestowed; and the grand *Corræa Latrobeana*,—three of the most gorgeous plants discovered during my last expedition.

In accordance with His Excellency's instructions, a collection of dried specimens of plants has been commenced for the Government. This Herbarium will be at all times accessible to the public, and will hereafter contribute, I trust, to diffuse, more and more, knowledge of our vegetable world, and excite lovers of natural science to assist in my investigations. I began to form, at the same time, a similar collection for the Royal Gardens at Kew.

I am happy to report that the Botanic Gardens are in a very prosperous state, and that the establishment does great honour to the able management of its Superintendent. The addition of a large greenhouse, which His Excellency has been pleased to sanction upon the recommendation of the Committee, will be most useful as a receptacle for tropical productions; and a considerable piece of ground has been prepared, this year, to rear all the seeds which have lately been collected for the garden, or which were liberally presented.

The Committee deemed it also desirable that an iron foot-bridge for crossing the Yarra should be procured from home, for the purpose of affording an easier access to the garden for the inhabitants of the eastern part of Melbourne; and by this means the number of visitors —already (chiefly on Sundays) very considerable—will doubtless greatly increase.

I trust, therefore, that the Botanic Gardens, as an establishment so desirable for the diffusion of knowledge, for the experimental introduction of foreign plants into our adopted country, or for multiplying the treasures which our own Flora offers, and as a healthy locality for recreation, will continue to receive the support of the Government and the Legislature; and I hope that, by still further extending the communications of this establishment with the Botanical Gardens of other

countries, we shall succeed in keeping pace with the general advance of this great and flourishing country.

I have the honour to be, etc.,

FERDINAND MÜLLER.

[This Report is followed by a catalogue of all the known native plants of the Colony, systematically arranged, collected, and examined by Dr. Müller, between September, 1852, and August, 1853.]

Botany of Victoria Colony.

The following are extracts from Letters recently received from Dr. F. MÜLLER, Colonial Botanist at Victoria, whose first Report on the Vegetation of that Colony we give in our present number.

Victoria Range, 21st November, 1853.

Encamped here, on a new botanical journey through this province, I observed for the second time within the last five years, a pretty little *Stylidium*, which most unfortunately, from badly developed and preserved specimens, was mistaken by me for a *Polypompholyx* (rather a gross error, considering the germen inferum), and passed accordingly into my diagnoses, which I have the pleasure of forwarding to you by His Excellency Governor Latrobe*, as *P. adenotricha*. Having, whilst travelling, on account of the burden, left all books behind except R. Brown's Prodromus, I am uncertain if my plant is the *Coleostylis umbellata* of Sonder. It approaches rather closely to *Stylidium umbellatum* of Labillardière, but will prove, most likely, a distinct species.

I left Melbourne a fortnight ago, and shall twice traverse the northern districts of this province during the coming five months.

I have met, to my great delight, with all Sir Thomas Mitchell's rarities of the Grampians, besides some which, during Sir Thomas's visit to this locality (June), were not in flower; so that I hope to be enabled to add amply to your great herbarium. *Myosurus australis* I found here again—the second locality which I know of this most interesting plant; *Marianthes bignoniaceus* and *Eriostemon Hillebrandi* occur also in the Grampians, as well as a beautiful subalpine *Bauera*, several *Melaleucæ*, *Mitrasacme*, *Stylidium*, *Stenanthera*, *Styphelia*, etc.. Most of them are new to me, and many, I presume, also new to science.

* The packet in question has not yet arrived.—ED.

In my letters, left with His Excellency, I have stated, that my collections under the hands of Dr. Sonder contain more than a thousand species of Van Diemen's Land plants. The very desired work of your celebrated son, 'Flora Tasmanica,' could, I am inclined to believe, receive ample additions from these sources; for I am convinced that Mr. Gunn did not find all the species which Mr. Charles Stuart procured for me. Of these, as well as any other Australian plants of my collection, I shall be but too happy to offer Dr. Joseph Hooker any specimens which he may consider useful for his pursuits; and I would take the liberty to advise Dr. Hooker to spend a week or two on a visit to Hamburg, as Dr. Sonder can also give from my letters perhaps much acceptable information.

Torrumbarrey, 5th January, 1854.

Being delayed here (on the Murray River) for a day, in order to recover some articles stolen from me while travelling lately to the junction of the Darling, and having apparently exhausted the Murray vegetation, as far as the season will permit me to add to my collection, I find an hour's agreeable employment in communicating to you the results of my botanical researches since my last letter has been despatched ("Victoria Range," end of November). I have since that time examined the neighbourhood of Mount Zero (already favourably known by Sir Thomas Mitchell's researches), and I had here the gratification of adding a considerable number of undescribed or rare plants to my last botanical stores, amongst them a most handsome new genus of *Myrtaceæ* (*Scaryomyrtus hexamera*) with a steel-blue scarious calyx, hexandrous and apetalous, otherwise allied to *Calycothrix* or rather *Lhotzkya*. From Mount Zero I proceeded to the Murray River, along the Avoca, traversing the Mallee scrub about Lake Lalbert, and towards the Darling, and in this journey there have been nearly three hundred species added to the Victoria Flora (including those previously discovered on the Grampians); so that my notes and collections comprise now about 1500 species from this colony.

The Mallee scrub of this Colony proved not to be so rich in new plants as I anticipated. I was, however, surprised to observe, that not only a large share of the South-Australian Murray plants extend so far easterly, but also that so many rarities, which I formerly only noticed on Lake Torrens (many degrees further north), range as species to be included in the Flora of this Colony. Of most of the species I

procured a sufficient number of specimens (notwithstanding having to carry them generally on my saddle-horse) as to supply you, as also some of your eminent botanical friends; and I hope Kew Garden will also receive some modest but nevertheless acceptable additions from the many kinds of seeds which I gathered. My main harvest of new, and I hope also ornamental plants, will be likely in the Alps to which I am now proceeding; and for the investigation of some prominent points, I shall devote the favourable months of February and March, and, if the weather becomes not too inclement, also April next.

I have not heard from Melbourne since I left that capital, but hope to receive letters in Albury, by which I will learn if my large box with specimens and some seeds, as well as the set of manuscript on the Victoria Flora, has been sent away by His Excellency, or will remain under his care till he returns home. By an occasional glance on a home paper, I perceived, to my great delight, that Professor William Harvey visits our shores for the purpose of enlarging and advancing his phycological works; and you will readily imagine that I shall hail his arrival in Melbourne, and his stay under my roof, with the greatest pleasure, being myself here almost in a botanical exile, and having to learn so very much from a man of Dr. Harvey's standing. The letters in which I desired Dr. Joseph Hooker to visit Dr. Sonder in Hamburg, for the purpose of selecting from my herbarium there a specimen of all those plants he may consider useful, many adding without doubt to his desirable 'Flora Tasmanica,' you will have received.

Dr. Harvey will see in my herbarium at least three hundred New Holland and Tasmanian Algæ.

FERD. MÜLLER.

Dr. Stocks and his Collections.

After many years zealously employed in botanical pursuits in the Bombay Presidency, particularly in Scinde and Beloochistan (as is well known to the readers of our Journal), Dr. Stocks is now on leave of absence, arrived in England with his collections: and he will for some time be engaged, with the aid of the Library and Herbaria at Kew, in the arrangement and description of them, and, we trust, in conjunction with Drs. Hooker and Thomson, of other plants illustrative of the botany of India.

NOTICES OF BOOKS.

SULLIVANT, WILLIAM S.: *Notices of some new Species of* MOSSES *from the* Pacific Islands, *in the Collection of the United States Exploring Expedition under* Captain Wilkes. (*Extracted from the Proceedings of the American Academy of Arts and Sciences*, vol. iii.) 8vo. 1853. Cambridge, U.S.A.

Twenty-three new Mosses are characterized, of the genera *Hypnum*, *Hookeria*, *Mniadelphus*, *Pilotrichum*, *Cryphæa*, *Neckera*, and *Rhizogonium;* and these may be considered a continuation of the 'Notices of new Mosses and Hepaticæ from Tierra del Fuego and Oregon,' belonging to the same collection, by the same able Muscologist, which were mentioned in this Journal, vol. ii. for 1850. We could have wished that some of the specific characters (twenty and more lines in length) could have been shortened and confined to the obviously essential characters, if it is intended they should be practically useful; and more full characters might then have followed the diagnoses.

Epistolæ Caroli a Linné *ad* Bernardum de Jussieu *ineditæ, et mutuæ* Bernardi *ad* Linnæum: *curante* Adriano de Jussieu, Academiæ Art. et Scient. Americanæ socio. 4to. Cambridgiæ, Nov. Angl. 1854.

We learn from the preface to these interesting letters, that they are the Latin originals, of which the translation appeared in the 2nd vol. of 'A Selection of the Correspondence of Linnæus and other Naturalists, from the Original Manuscript, by Sir James Edward Smith,' pp. 206–227. The whole was committed for publication, in the Acts of the Academy above quoted, to our valued friend Dr. Asa Gray, who has appended the following note:—

"In communicating the manuscript of the article comprising the epistolary correspondence of Linnæus with his great-uncle Bernard de Jussieu, the Editor requested that the proofs should be remitted to Paris for his revision, in order that they might be collated with the original documents, so as to ensure the entire accuracy of the transcript. The lamented death of our distinguished foreign associate, which oc-

curred about the time that the article was consigned to the printer, has prevented this intention from being carried out. All that could be done, therefore, was sedulously to follow the manuscript, prepared with M. de Jussieu's accustomed neatness and care. The few conjectural emendations that have been suggested are, in all cases, enclosed in brackets."

The annotations and remarks of the Editor possess the melancholy interest of having been probably the last scientific production of the last of the Jussieus.

Adrien de Jussieu, the grand-nephew of Bernard, the only son of Antoine Laurent de Jussieu (author of the 'Genera Plantarum secundum Ordines Naturales dispositæ'), himself a botanist worthy of such a lineage,—a man admired and beloved by all who knew him,—died without male heirs, on the 29th of June, 1853, aged fifty-six years, thus closing a line illustrious without a parallel in botany for nearly a century and a half.

Conspectus Begoniacearum.

Notice is given in the 'Linnæa,' for March, 1854, of an attempt on the part of our valued friend Dr. Klotzsch, to divide the genus *Begonia* into genera; and no less than thirty-three are here proposed, and the essential characters given there,—characters depending mainly on the nature of the style, persistent or deciduous, the structure of the capsule, the form of the placentæ, more or less spiral character, etc. of the forms of the lobes of the stigma, and of the anthers, the number of sepals, etc. The materials employed appear to be chiefly, if not entirely, well known species, that is, such as have been fully described or figured; and though the total number of species brought under their respective genera is considerable, we find them to be mainly of South American origin, in which our gardens are so rich. We do not find more than half-a-dozen noticed from the East Indies; and we fear that, in taking so circumscribed a view of species, Dr. Klotzsch is hardly in a condition to determine the limits of the genera, or to say what should constitute generic, or what mere specific, characters.

Decades of Fungi; *by the* Rev. M. J. Berkeley, M.A., F.L.S

Decades XLIV.–XLVI.

Indian Fungi.

(*Continued from p.* 143.)

* *Polyporus cinnabarinus*, Fr.

Hab. On dead wood. East Nepal. (Dr. Hooker.)

* *P. scruposus*, Fr.

Hab. Iwa river, East Nepal. Dec. 13. Soane river, Behar. (Dr. Hooker.) There is also a form from Ratong river, 7000 feet; gathered January 6; distinguished by the strigose fasciculate hairs with which it is clothed, somewhat after the fashion of *Trametes hydnoidea.*

431. *P.* (Inodermei) *xeranticus*, n. s.; pileo dimidiato-reflexo tenui coriaceo-flexili tabacino zonato rugoso subsericeo; contextu aureo; poris parvis angulatis, dissepimentis tenuibus.

Hab. On charred wood. Leebong. (Dr. Hooker.)

Pileus 1–3 inches across, $\frac{1}{2}$–$\frac{3}{4}$ of an inch long, reflected, ferruginous, here and there tinged with yellow, of a soft flexible coriaceous consistence, more or less zoned, and rugose with impressed furrows, soft to the touch, but scarcely silky. Substance yellow. Pores small, $\frac{1}{72}$ of an inch across, angular; dissepiments thin, edge acute, slightly toothed, wood-coloured, but acquiring a foxy tint when dry or old, resembling in general appearance *Stereum ferrugineum.* The back is often marked with spots similar to those on the margin of *P. dryadeus.*

432. *P.* (Inodermei) *flavidus*, n. s.; pileo subreniformi tenui flavido-fulvo zonis brunneolis picto radiatim rugoso velutino; poris minutis ferrugineis; contextu flavo.

Hab. On dead wood. East Nepal. (Dr. Hooker.)

Pileus $2\frac{1}{2}$ inches across, $1\frac{1}{4}$ long, slightly imbricated, subreniform, thin, rigid and brittle when dry, rough with raised radiating wrinkles, of a dull tawny, adorned with narrow brownish zones clothed with short velvety pubescence; edge very acute; substance yellow. Pores ferruginous, $\frac{1}{140}$ of an inch across, moderately long, angular; dissepiments thin.

A very elegant species, calling to mind *P. Splitgerberi* by the colour of the substance of the pileus.

* *P. caperatus*, Klotzsch.

Hab. On dead wood near the ground. Paras Nath. (Dr. Hooker.)

Old dead specimens, 5 inches in diameter.

433. *P.* (Inodermei) *pictilis*, n. s.; pileo subflabelliformi vertice affixo subtiliter velutino multizonato, zonis glabrescentibus; contextu postice subochraceo; poris brevibus ochraceis, dissepimentis rigidiusculis, acie acuta submembranacea.

Hab. On dead birch, 12,000 feet. East Nepal. (Dr. Hooker.)

Pileus $1\frac{1}{2}$ inch or more broad, 1 inch long, thin, very rigid and contracted when dry, minutely velvety, marked with numerous narrow concentric ochraceous zones, which are at length smooth. Hymenium ochraceous; pores $\frac{1}{96}$ of an inch across; dissepiments rather rigid; edge acute, at length submembranaceous and minutely toothed.

Nearly allied to some forms of *P. versicolor*, but, from its great contraction, the substance is probably more fleshy, and the whole appearance resembles that of *P. zonalis*.

* *P. versicolor*, Fr.

Hab. Nangki, East Nepal, alt. 9000 feet. Darjeeling. (Dr. Hooker.)

Beautifully zoned; pores larger than usual, $\frac{1}{72}$ of an inch across; in the European forms about $\frac{1}{96}$.

There are also magnificent specimens, with smaller pores, from Leebong.

* *P. Nilgherrensis*, Mont.

Hab. On dead wood. East Nepal. Darjeeling. (Dr. Hooker.)

* *P. elongatus*, Berk.

Hab. Leebong. 7000 feet. (Dr. Hooker.)

A velvety form was gathered on Paras Nath.

434. *P.* (Inodermei) *Nepalensis*, n. s.; candidus, carnoso-mollis; pileo flabelliformi cute tenuissima glabra vestito; poris mediis dissepimentis tenuissimis, acie acuta.

Hab. On dead wood. Nangki, East Nepal, alt. 10,000 feet.

White. Pileus 2 inches across, nearly $1\frac{1}{2}$ long, flabelliform, thin, fleshy, covered with a thin smooth cuticle. Pores about $\frac{1}{36}$ of an inch across; dissepiments extremely thin, almost membranaceous when dry; edge acute.

Allied to *Polyporus pubescens*, but very distinct. The middle-sized delicate pores, smooth surface, and thin substance, distinguish it from all other species. As regards general appearance it may be compared *P. virgineus*, Schwein.

435. *P.* (Inodermei) *corium*, n. s.; candidus; pileo papyraceo-coriaceo tenui flexili subtiliter tomentoso; poris parvis, dissepimentis tenuissimis, acie acuta subintegra.

HAB. Sikkim. 12,000 feet. (Dr. Hooker.)

White. Pileus $1\frac{1}{2}$ inch broad, attached behind and decurrent, reflexed in front, of a thin flexible substance, resembling white kid leather; nearly smooth, rugose, margin arched. Pores minute, $\frac{1}{84}$ of an inch across, angular; dissepiments thin; edge nearly entire.

A singular species, remarkable for its flexible texture, resembling somewhat very thin specimens of *P. velutinus.*

436. *P.* (Inodermei) *gratus*, n. s.; pileo postice latissime decurrente, margine reflexo, subtiliter sericeo lanatoque ligneo-pallido; contextu candidissimo, serius cum pileo concolore; poris longis minutis dentato-elongatis.

HAB. On the ground, doubtless attached to wood. Himalayas. (Dr. Hooker.)

Pileus 4 inches broad, decurrent for three inches, the reflected portion about an inch long, pale wood-coloured, finely silky, and in parts delicately woolly, especially behind; substance tolerably firm, thin, here and there white as snow, but at length coloured like the pileus, brittle. Pores 2–3 lines deep, not $\frac{1}{120}$ of an inch broad, delicate. Edge produced principally in front into one or more acute teeth.

A very delicate species, allied to *P. velutinus*, remarkable for its long-toothed pores.

437. *P.* (Resupinatus) *cereus*, n. s.; resupinatus, tenuis, mycelio spongioso ferrugineo oriundus; contextu parco flavo; poris minutis cereis, acie tenui denticulata.

HAB. On dead wood. East Nepal; high valleys. (Dr. Hooker.)

Spread over the surface of the wood for 3 or 4 inches, substratose, thin, invested with a spongy ferruginous mycelium; substance thin, yellow. Pores wax-coloured, minute, $\frac{1}{96}$ of an inch across, angular; edge thin, sometimes lacerated, sometimes drawn out into acute teeth.

A stalactitic form occurs, in which the edge of the tubes is more regularly drawn out. This I had at first supposed a form of *P. scruposus.*

438. *P.* (Resupinatus) *Beharensis*, n. s.; resupinatus, margine reflexus; supra umbrinus, subvelutinus; hymenio albo; poris primum punctiformibus parvis, acie obtusissima, sero tantum elongatis acie acutiuscula.

HAB. On dead wood. Soane river, Behar. (Dr. Hooker.)

Spreading in little patches, which arise from the confluence of many individuals, resupinate, with the extreme edge reflected. Above clothed with umber or tawny, somewhat velvety down. Hymenium white, for a long time having only very shallow punctiform pores, with entire obtuse borders, at length elongated, $\frac{1}{80}$ of an inch broad; edge rather acute, entire. The new hymenium springs year after year from the old hymenium, so that some specimens assume the peculiar appearance of old plants of *Stereum frustulatum.*

439. *Trametes Hookeri,* n. s.; pileo reniformi disco lato affixo sublævi subtiliter pubescente rufescente; poris subhexagonis mediis lignicoloribus.

Hab. On dead wood. Darjeeling. (Dr. Hooker.)

Pileus subreniform, fixed by a broad orbicular disc, 4 inches across, 3 inches long, nearly even, zoneless, finely pubescent, at length acquiring a rufous tinge, contracting when dry, as if softer than in the neighbouring species; sometimes proliferous, in which case the pilei are much thinner, and more evidently pubescent; margin acute, substance white. Pores sometimes punctiform, but, when well developed, subhexagonal, $\frac{1}{36}$ of an inch across.

This species has much the appearance of *Polyporus rufescens.* As in some other neighbouring species, the perfect state of the pores is totally different from that which sometimes prevails.

440. *T. crenulata,* n. s.; pileo suberoso subflabellato disco orbiculari affixo postice definite decurrente candido tomentoso zonato rugoso; margine tenui crenulato; poris elongatis mediis sinuosis.

Hab. On dead wood. Darjeeling. (Dr. Hooker.)

Pileus corky, 4–6 inches across, 3 inches long, subflabelliform, decurrent behind, attached by a broad orbicular disc, white, pubescent, marked with numerous zones, and rugged with radiating elevations. Edge thin, acute, crenulate. Pores white, oblong, $\frac{1}{36}$ of an inch across, $\frac{1}{24}$ long, often more or less sinuated; edge obtuse, or, in specimens in which the pores are most developed, rather acute.

Allied to *T. lactea,* Berk., but a distinct species, remarkable for its acute, crenulate border. There is also a state, but clearly not normal, with a more obtuse and entire border.

441. *T. cingulata,* n. s.; pileo tenui suberoso reniformi crebrizonato subtiliter pubescente; stipite laterali disciformi; poris minutis punctiformibus, acie integra obtusa.

Hab. On dead wood. Soane river. (Dr. Hooker.)

Corky, dirty white, shaded and zoned with pale yellow. Pileus 2–4 inches across, $1\frac{1}{4}$–2 inches long, reniform, 1 line or more thick, very minutely pubescent, marked with numerous concentric grooves and zones, sometimes in parts fuliginous, but possibly with some extraneous matter; edge thin, but in general obtuse, barren; stem a lateral disc, seldom visibly elongated. Hymenium concave; pores minute, $\frac{1}{120}$ of an inch across, round, punctiform; edge obtuse, quite entire.

Allied to those species of *Trametes* which resemble *Lenzites repanda*, but a small thin species, with somewhat of the habit of *Polyporus velutinus*.

* *T. lobata*, Berk.

Hab. On dead wood. Darjeeling. (Dr. Hooker.)

Two forms of this occur in addition to the one originally described, the first very even, and of a tawny tint, the second thicker and rugged.

* *T. colliculosa*, Berk.

Hab. On dead wood. Darjeeling. (Dr. Hooker.)

442. *T. tephroleuca*, n. s.; pileo dimidiato rigido-coriaceo candido zonato strigoso-velutino; contextu candido; poris mediis cinereis, dissepimentis rigidis quandoque elongatis, acie acuta.

Hab. On dead wood. Nangki, East Nepal, alt. 10,000 feet. (Dr. Hooker.)

Pileus 3 inches across, 2 inches long, dimidiate, subreniform, sometimes slightly lobed, coriaceous, rather hard, zoned, clothed with dense white strigose hairs. Pores middle-sized, $\frac{1}{36}$ of an inch across, ash-coloured, sometimes a little elongated in front; dissepiments rigid; edge acute.

Resembling *Polyporus hirsutus*, but with larger, differently-coloured pores. It is quite clear that if the genus *Trametes* is to be retained, many more species must be removed into it from *Polyporus*. Fries has made a good many changes in this direction, which will in all probability be ultimately adopted.

443. *T. immutata*, n. s.; pileo dimidiato rigido-coriaceo zonato strigoso subvelutino albido; poris mediis; acie membranacea sublacerata.

Hab. On dead wood. Khasia Mountains. (Dr. Hooker.)

Pileus 4 inches across, 2 inches long, of a rigid coriaceous texture, zoned, clothed thinly with strigose hairs, more velvety behind. Pores middle-sized, $\frac{1}{36}$ of an inch across, white; dissepiments moderately firm; edge thin and membranous, slightly toothed.

This species is very close to *T. tephroleuca*, but there is no cinereous tint about the pores, the walls of which are not so rigid, and above all, their edge is prolonged into a toothed membrane.

* *T. ozonioides*, Berk.

HAB. On charred wood. Leebong, 6000 feet. (Dr. Hooker.)

A resupinate form, with the margin narrowly reflected, and scarcely so thickly covered with strigose fascicles of hairs as in more perfectly developed specimens.

* *Dædalea sanguinea*, Klotzsch.

HAB. On dead wood. East Nepal. (Dr. Hooker.)

* *D. tenuis*, Berk.

HAB. On dead wood. Paras Nath; Khasia Mts. (Dr. Hooker.)

444. *D. Emodensis*, n. s.; ligneo-pallens; pileo dimidiato crassiusculo subvelutino postice demum laccato-polito; sinubus oblongis brevibus.

HAB. On dead wood. Leebong. (Dr. Hooker.)

Pileus 4–5 inches across, $2\frac{1}{2}$ or more long, dimidiate or subflabelliform, pale wood-coloured, rather thick, zoned, more or less velvety, at length slightly laccate behind; margin acute. Hymenium rather darker than the pileus; pores mostly oblong, about $\frac{1}{40}$ of an inch across, varying considerably in length; dissepiments rigid; edge obtuse.

This species is always more or less velvety, sometimes densely, sometimes however nearly smooth, and is very distinct from every form of *Lenzites repanda*, with which it ought not to be confounded, though, like other similar Fungi, it varies considerably.

445. *Cyclomyces turbinatus*, n. s.; pileo turbinato deorsum cum stipite radicato extus ferrugineo-spongioso confluente.

HAB. On decayed wood, Nunklow. (Dr. Hooker.)

Pileus about an inch broad, turbinate, hollowed out above, with the margin expanded, minutely velvety, ferruginous. Stem attenuated downwards, rooting, clothed with dense, spongy, ferruginous pubescence, $1\frac{1}{2}$ inch high, half an inch thick in the middle; laminæ narrow.

There are but two specimens of this curious production, neither of which is in a satisfactory state. The colours are nearly those of *Polyporus oblectans*, from which the concentric laminæ and peculiar rooting stems at once separate it. Both the specimens seem to have been attached below through their whole length.

* *Hexagonia Wightii*, Klotzsch.

HAB. Soane river, Behar. (Dr. Hooker.)

Varying greatly in the shape and length of the pores. They are often elongated on one side, especially in front, and are then sinuous, sometimes as much so as in *Dædalea.*

* *H. polygramma*, Mont.

HAB. Paras Nath; Soane river, Behar. (Dr. Hooker.)

* *H. tenuis*, Fr.

HAB. On dead wood. Eastern Nepal; Darjeeling. (Dr. Hooker.

There is also a very beautiful variety, thicker and more rugged, and resembling externally some states of *Lenzites Klotzschii.*

* *Favolus multiplex*, Lév.

HAB. Churra. (Dr. Hooker.) June.

There seems very little difference, if any, between this species and *F. lacerus*, Fr., from Costa Rica.

446. *F. setiporus*, n. s.; pileo dimidiato pallide flavo radiatim lineato-rugoso; poris amplis intus setigeris.

HAB. On dead wood. Nunklow. July, 1850. (Dr. Hooker.)

Pileus 2 inches broad, dimidiate, sometimes flabelliform, thin, pale yellow, rough with fine raised lines, subzonate when dry, from the contraction of the substance over the pores. Pores large, hexagonal, 1–2 lines broad, clothed with short bristles, or rather subtriangular laminæ within.

Allied to *F. intestinalis*, the walls of whose pores are however quite smooth.

447. *Merulius lignosus*, n. s.; dependens ligneus; vertice elongato incrassato margine obtuso; hymenio poroso-venoso; poris amplis.

HAB. On dead wood. Darjeeling. (Dr. Hooker.)

Hard, woody, at least when dry; 2 inches across, fixed by the vertex, which is greatly elongated, irregular, and entering into the substance of the matrix; edge tawny. Pores dark, irregular, unequal, nearly a line broad.

* *Hydnum zonatum*, Batsch.

HAB. On the ground, in woods. Khasia, 5–6000 feet. July, 1850. (Dr. Hooker.)

"Dirty brown; border yellow."

448. *H. vespertilio*, n. s.; nigrum; pileo tenui infundibuliformi profunde fisso zonato radiatim lineato, zonis elevatis.

HAB. On the ground. Nunklow. July 10, 1850. (Dr. Hooker.)

Black. Infundibuliform, 2 inches across, 1½ inch deep, strongly cleft, marked to the very base of the funnel with raised zones and a few radi-

ating lines or wrinkles; at first tomentose, then smooth. Stem obsolete, or confluent with the base of the pileus. Spines very slender, acute, decurrent.

This species has many points in common with *H. nigrum*, but it is strongly zoned, and there is no true stem, or scarcely any. Whether the spines are in any stage white, I am unable to say.

* *H. erinaceus*, Bull.

Hab. On dead wood. Sikkim, 7500 feet; abundant. (Dr. Hooker.)

* *H. flabelliforme*, Berk.

Hab. Leebong. (Dr. Hooker.)

449. *Irpex zonatus*, n. s.; ligneo-pallens; pileis imbricatis subflabelliformibus coriaceo-rigidis zonatis subtiliter tomentosis glabrescentibus, margine lobatis, dentibus basi compressis.

Hab. On dead wood, surrounding sticks. Sikkim; East Nepal. November 8. (Dr. Hooker.)

Imbricated, pale wood-coloured. Pileus 4 inches or more broad, 2 inches long, laterally confluent, more or less flabelliform, with the margin lobed, marked with numerous concentric grooves, rugose, very finely tomentose, at length smooth. Hymenium tinged with brown; teeth compressed at the base, laterally confluent, above 2 lines long, quite smooth.

A splendid species, which may be compared with *I. canescens*, with the habit of *I. incrustans*, Berk. and Mont., a species from British Guiana. The Nepal specimens are more even, and do not exceed an inch in length; they are probably younger. From these it appears that the original form is elongato-flabelliform.

* *I. flavus*, Klotzsch.

Hab. Soane river. (Dr. Hooker.)

And var. *orbicularis*.—*Polyporus flavus*, var. *orbicularis*, Junghuhn, Crypt. Jav. p. 48.

Hab. On old bamboo of Boat; Ganges. March 20, 1848. (Dr. Hooker.)

Exactly according with the figure of Junghuhn, and in habitat. The mycelium in his plant runs in the cavity of the bamboo, and bursts through holes perforated by insects, and the Ganges plant appears to grow in the same manner. The substance is yellow, but the outer surface is bleached.

450. *Radulum spongiosum*, n. s.; pileo dimidiato tenui spongioso fusco pallescente subzonato fasciculatim substrigoso; hymenio fusco.

HAB. On dead wood. East Nepal. (Dr. Hooker.)

Pileus 2 inches across, 1 inch long, dimidiate, thin, of a soft, spongy consistence, brown, becoming dirty-white, clothed with scattered, brown, fasciculate, strigose threads, slightly zoned in front; edge acute, more or less fringed; substance tinged with reddish-grey. Hymenium brown; teeth short, irregular, often notched above, subacute, pulverulent.

This curious Fungus combines the habit of *Lenzites striata* with the characters of *Radulum*. The specimens are not in the least decurrent, and the teeth are apparently in their normal condition.

* *Thelephore palmata*, Fr.

HAB. On the ground. Khasia (Nunklow). July, 1850. (Dr. Hooker.)

Black, with white tips.

* *T. dendritica*, P.

HAB. On rotten wood. Nunklow. July 12, 1850. (Dr. Hooker.)

A single small specimen, every part of which was white when gathered.

451. *Stereum endocrocinum*, n. s.; pileo crasso suberoso postice decurrente antice reflexo profunde concentrice sulcato velutino hispido intus aurantiaco; hymenio ochraceo-fusco.

HAB. On dead branches. Yangma valley, East Nepal. Nov. 29. (Dr. Hooker.)

Corky, 2 lines thick. Pileus 2 inches across, decurrent behind, reflected in front, so as to form an irregular cap, deeply sulcate above, coarsely velvety; margin obtuse; substance deep orange or brick-red, clothed, where attached, with spongy pubescence of the same colour. Hymenium even ochraceous, tinged with brown.

A very curious species, calling to mind *Hydnum aurantiacum*, by the colour of its mycelium.

* *S. hirsutum*, Fr.

HAB. Sikkim; woods at Leebong. (Dr. Hooker.)

A pretty variety, with a whitish pileus, approaching to some state of *S. lobatum*.

* *S. lobatum*, Fr.

HAB. On dead wood. Khasia (Churra). July, Aug. (Dr. Hooker.)

* *S. spadiceum*, Fr.

HAB. Sikkim; Lachen. 8000 feet. August 4, 1849. (Dr. Hooker.)

452. *S. cacao*, n. s.; tabacinum; pileis imbricatis connato-flabelliformibus plicatis zonatis velutinis; hymenio concolore subtiliter setuloso.

HAB. On dead timber. Khasia Mts. July 7, 1850. (Dr. Hooker.)

Forming dense orbicular patches 3 inches or more in diameter, closely imbricated; pilei thin but rather rigid, flabelliform, connate, deeply lobed and plicate, furrowed with a few zones, of a rich chocolate-brown, velvety; hymenium marked with a few concentric ridges of the same colour as the pileus, minutely setulose.

A very pretty species, allied to *S. rubiginosum*, but far more minutely setulose than its allies.

* *S. Mougeotii*, Fr. (sub *Corticio*) Moug. et Nest. n. 581.

Hab. On wood. Yangma Valley, Eastern Nepal. November 29. Singalelah, Sikkim, 1848. 10,000 feet. (Dr. Hooker.)

Precisely the plant of Mougeot and Nestler, but much larger. The ferruginous substratum is very remarkable in this fungus, which approaches very near to such species as *S. tabacinum*. The hymenium is distinctly spinuloso-setose as in that species, the bristles being of the same colour as the hymenium.

453. *S. scytale*, n. s.; rigido-coriaceum, ambienti-liberum; pileo lobato zonato radiatim ruguloso subvelutino spadiceo; contextu concolori; hymenio ochraceo umbrinoque.

Hab. On dead wood from Khasia Mountains (Hooker and Thomson) to the Western Himalayas (Capt. Strachey).

Of a rigid coriaceous substance, but rather flexible; brittle when dry, and easily splitting from the base to the margin, effused, with the border reflected widely, 3 inches or more, zoned and grooved, marked with little longitudinal wrinkles, especially in the larger and thicker individuals, deep brown inclining to red; finely velvety or pubescent; substance brown, like the pileus; hymenium ochraceous or tinged with umber, sometimes finely wrinkled towards the edge.

This species has many points in common with *S. rugosum*, but more especially with *S. subpileatum*. Though running over the matrix, and at first adnate with it, the border becomes widely reflected and lobed. Thick specimens approach the magnificent *S. princeps*, which has at present not been found out of Java.

* *Corticium læve*, Fr.

Hab. On decayed wood. E. Nepal; Nangki, 10,000 ft. (Dr. Hooker.)

A form of *Corticium læve* approaching *C. incarnatum*, but with no tendency to assume the brighter colours of that species. There is no distinct byssoid margin, but merely a tomentose white mycelium.

* *Exidia hispidula*, Berk.

HAB. Kosderah, Soane river. February 20, 1848. (Dr. Hooker.)

* *Laschia tremellosa*, Fr.

HAB. Sikkim; woods at Leebong, 5000 feet. (Dr. Hooker.)

454. *Laschia lamellosa*, n. s.; pileo subreniformi lobato; plicis primariis radiantibus lamellæformibus, interstitiis venosis.

HAB. With *L. tremellosa*. Leebong. (Dr. Hooker.)

Pileus $\frac{3}{4}$ of an inch or more across, reniform or suborbicular, lobed, rough with velvety matted pubescence; primary folds lamelliform, distant, secondary forming reticulations in the interstices.

Resembling, except in substance, a *Xerotus*.

455. *Tremella protensa*, n. s.; pallide luteo-virens e basi angusta dilatato-protensa digitato-lobata undulata apicibus obtusis furcatis. Hook. n. 55.

HAB. On trees, Sikkim; Darjeeling, 7,500 feet. (Dr. Hooker.)

Forming large, highly gelatinous, pale ochraceous masses, inclining to green; base narrow, plicate; spreading out above into elongated lobed undulate fronds, whose tips are obtuse and forked. Filaments of the interior thicker, even, anastomosing; ultimate threads more delicate, undulate, bearing at their apices obovate sporophores.

This curious species has something of the habit of *T. vesicaria*, which is a true *Tremella*, and not an *Alga*, as stated by Fries, notwithstanding its terrestrial mode of growth.

* *Dictyophora speciosa*, Klotzsch.

HAB. Sikkim; Khasia (Churra). June. (Dr. Hooker.)

Phallus Dæmonum, Rumph., appears to be the same thing.

* *Clathrus cancellatus*, L.

HAB. On the ground. Myrong; Khasia. July, 1850. (Dr. Hooker.)

* *Geaster hygrometricus*, P.

HAB. Simla. (Dr. Thomson.)

* *G. limbatus*, Fr. Forma minor.

HAB. Simla. (Dr. Thomson.)

* *Trichocoma paradoxum*, Jungh.

HAB. East Nepal. (Dr. Hooker.)

Found also in Java and South Carolina.

* *Bovista*, sp.

HAB. North-western Himalayas. (Dr. Thomson.)

The specimens are unfortunately not in a sufficiently good state to determine specifically.

456. *Lycoperdon elongatum*, n. s.; stipite elongato sursum incrassato

cum peridio obovato granulato, ore lato aperto confluente; sporis majoribus echinulatis.

HAB. On the ground, amongst moss. East Nepal and Sikkim; Darjeeling, 7,500 feet. (Dr. Hooker.)

Stem 2 inches high, $\frac{3}{4}$ of an inch thick, confluent above, with the obovate finely granulated peridium; orifice rather wide, but determinate. Capillitium umber; spores purplish-brown, $\frac{1}{4500}$ of an inch in diameter, rather dark, echinulate, sometimes stipitate.

A very distinct species, allied to *L. gemmata*, extremely flaccid, and remarkable for its rough spores, in which character it agrees with *L. atro-purpureum*, Vitt.

* *Lycoperdon fucatum*, Lév.

HAB. Khabili river. 5–6000 ft. E. Nepal. Dec. 10. (Dr. Hooker.)

Of this there is only a portion of the capillitium, which agrees with Léveillé's species in its vinous tint and rough spores.

457. *L. delicatum*, n. s.; globosum; peridio membranaceo verrucis parvulis exasperato; capillitio sporisque echinulatis pedunculatis fusco-purpureis.

HAB. On the ground. Khasia Mountains. (Dr. Hooker.)

About 2 inches in diameter, subglobose; peridium membranaceous, rough with minute pointed warts, opening by an irregular aperture at the apex. Stem none. Capillitium and spores purple-brown; spores $\frac{1}{4000}$ of an inch in diameter, rough with little points, seated on a peduncle four times as long as themselves.

458. *L. Emodense*, n. s.; peridio ovato furfuraceo-squamuloso brevissiem stipitato, ore magno irregulari rupto; capillitio griseo, sporis argillaceis.

HAB. On the ground. Sikkim, 15,000 feet. Phulloot, East Nepal, 9000. November 10. (Dr. Hooker.)

About an inch high, $\frac{3}{4}$ thick, ovate or subglobose; peridium very delicate, clothed with very minute umber-brown branny scales or granules, less closely above, opening by a wide aperture. Capillitium greyish; spores clay-coloured, about $\frac{1}{6500}$ of an inch long.

Very distinct from *L. microspermum*, of which it has somewhat the appearance, in its larger spores.

459. *L. xanthospermum*, n. s.; globosum; peridio tenuissimo, maculis peridii externi reliquiis notato; capillitio sporisque pedicellatis flavis.

HAB. On the ground. Khasia, at Moflong. June 29, 1850. (Dr. Hooker.)

About an inch in diameter, stemless, yellowish, marked with minute brown specks, the remains of the outer coat, but by no means furfuraceous. Capillitium and spores yellow; spores $\frac{1}{6500}$ of an inch in diameter, often furnished with a minute peduncle.

Allied to the last, but differing in the nature of the outer peridium, the pedicellate spores, etc.

* *L. pusillum*, Batsch.

HAB. On the ground. Eastern Nepal. (Dr. Hooker.)

The specimens differ from the two preceding in their flocculent, not scaly or areolate coat. The spores are of the same size as in those species. In *L. microspermum* they do not exceed $\frac{1}{8250}$.

* *Scleroderma Geaster*, Fr.

HAB. On clay-banks. Khasia, at Nunklow, 4–5000 feet. July. (Dr. Hooker.)

460. *S. nitidum*, n. s.; peridio ovato apice irregulariter dehiscente; epidermide in squamas polygonas depressas tenuissimas rupto; stipite lævi subtomentoso deorsum incrassato rigido, in radices paucas validas fisso.

HAB. Nangki; Eastern Nepal, alt. 10,000 feet. (Dr. Hooker.)

Peridium regularly ovate, $1\frac{1}{4}$ inch thick, obtuse, but narrowed above; the cuticle broken up into flat, polygonal, darker areæ, bursting at the apex. Stem 1 inch high, 5 lines thick, solid, firm, even, somewhat downy, divided below into two or three stout solid roots, which give forth abundant mycelioid threads. Mass of spores pale earthy-olive, with a very few yellowish veins, granulated, $\frac{1}{2500}$–$\frac{1}{3500}$ of an inch in diameter. There is also a smaller form with a shorter stem.

Allied to *S. Lycoperdoides*, Schwein., having, like that, the habit of *Tulostoma*, but a larger species. The stem is quite even above the strong roots, which are very peculiar.

* *Mitremyces Junghuhnii*, Schlecht. et Müll. in Bot. Zeit. 1854, p. 401, cum ic.

HAB. On the ground. Sikkim, at Chola, 6000–8000 feet. East Nepal. (Dr. Hooker.) Bhotan, Mr. Nuttal.

The only difference which I find between the Khasia and Sumatra specimens is, that the former are more warty. They grow in little tufts. The outer integument cracks off without forming a distinct cap, as in *M. australis* and some other species. The spores are globose and granulated, about $\frac{1}{2500}$ of an inch in diameter.

* *Diderma contextum*, Pers.

HAB. On the under surface of living leaves. Sikkim, at Darjeeling. (Dr. Hooker.)

The sori are from 2–5 lines broad, and are surrounded by a white reticulated border, consisting of abortive peridia. The external peridium is rather thicker than usual; there is no columella. The flocci are white and well developed; the spores globose, $\frac{1}{2625}$ of an inch in diameter.

* *Arcyria punicea*, P.

HAB. On decayed wood. E. Nepal; Bheti, 4000 feet. (Dr. Hooker.)

The spores are slightly smaller than in British specimens.

(*To be continued.*)

Report of a JOURNEY OF DISCOVERY *into the Interior of* WESTERN AUSTRALIA, *between* 8*th September*, 1848, *and* 3*rd February*, 1849; *by* J. S. ROE, ESQ., Surveyor-General.

(*Continued from p.* 151.)

On 14th of December we resumed our examination down the river, eagerly examining every accessible cliff we met, but discovering no shales. Granite or gneiss, with a large proportion of hornblende in it, was in contact with these cliffs, and did not raise our immediate hopes of coal; nevertheless, at half a mile within the mouth of the river, a mass of dark red sandstone projected from its right bank into a deep navigable reach, seventy yards across, and indicated a closer proximity to the object of our search. The water was here quite salt, and about twenty feet deep, tenanted by many fine large fish, resembling bream, upwards of a foot in length, which resisted the most tempting inducements we could hold out to them to take a bait. Below this spot the shores, both of the river and of a fine large estuary which received it, were low and sandy, and no more sandstone was seen to crop out upon them.

In less than a mile from the mouth of this river, our western course was arrested by the open deep reach of another, at least 250 yards across, coming from the northward and flowing into the same estuary. Having ascertained that its mouth, which was a quarter of a mile lower down, and divided into two open channels, was not fordable, I commenced its examination upwards. The low level banks soon rose to more undulating land, of light sandy character, clothed with some good grass extending half a mile back, and growing among *Nuytsiæ*, gigantic

Zamiæ, yeit, tea-trees, *Jacksoniæ*, etc. In less than three miles the width of the open water had contracted to 100 yards, and a considerable peninsula, thickly covered with high grass, was projected by it to the eastward. Hereabouts several large grassy tributaries were added, and a little higher up a dry rocky ledge connecting the two banks obliquely, enabled us to cross to the right bank. The land on that side however was found to be so rocky and steep that we soon afterwards recrossed, and finally encamped on one of the above-mentioned tributaries, at the first fresh-water hole we had discovered in connection with the river. Grass was here in ample sufficiency for our wants; and the river itself, which had now dwindled to a very brackish tea-tree brook, five yards across, wound its tortuous way through a well-grassed flat a quarter to half a mile wide. Red cliffs occasionally broke out on the hill-sides thus far, and the land on either side of the river's valley had all the flat-topped appearance of the sandstone formation; but granite or gneiss was the prevailing rock on the lower levels, with occasional veins of quartz through it, to the thickness of a foot. All our spare time was now directed to the horses' backs and feet, for the former required constant attention, especially to protect them from the flies, whilst many of their shoes were loose, and some cast altogether. To make good these defects, in the rough country we were in, was most essential, but the practical knowledge of farriery amongst the whole party was small; necessity however proved as usual an excellent assistant in overcoming difficulties, and, without laming a single horse, Mr. Gregory soon became an excellent farrier.

On essaying to follow up the river on the 15th, so many branches here fell in that it was not easy to decide on the principal one; but in such a case I deferred to the native's judgment, and kept to a valley from the N.N.W. At the end of a mile a larger tributary than usual, containing considerable pools of open water, joined from the eastward, and appeared to me to be the main branch; for that which we followed to the N.N.W. soon diminished in importance, and ascended rapidly in a rough granite bed, between somewhat steep rocky banks. Although grass still covered the slopes of the narrow valley which contained the river, the latter was so much reduced in size and character that I deemed it no longer worth following, and at ten miles from its mouth quitted it, for the purpose of making a further examination of the estuary; for, as that neighbourhood presented indications of coal, I was

desirous of ascertaining what facilities existed for its transport by water. Where I quitted this river it was coming from the N.W., and lay in irregular rocky pools, usually salt. The stratified gneiss rock, of dark glittering appearance, which here formed the basis of the country, was observed to lie in the direction of the magnetic meridian, with a decided dip to the eastward of about 15° from the vertical. Fragments of red sandstone, several inches square, lay on the surface near our rocky bridge, and contained many perfect impressions of bivalve shells. Crossing to the right bank by the rocky bridge, we came out on the estuary by some good grassy slopes near its mouth. The water in some of the holes in the rocks, from two to twelve feet in diameter, was found to be perfectly fresh and good, whilst in others, almost in contact with them, it was far too brackish for use. The pools and holes were not full, and thin layers of salt, encrusted on the rocks, showed the gradual process of evaporation, as the river had ceased to run. The fragments or *débris* on the banks (for in the actual bed of the river there were none) consisted chiefly of water-worn pieces of granite, quartz, whin, streakstone, red sandstone, oolitic conglomerate, and a variety of fragments of dark slaty colour and very hard close grain. Calcareous rocks and red sandstone had repeatedly occurred during the day, as we passed over a rough undulating country, otherwise uninteresting.

On the 20th of December, as we advanced westward, the geological indications acquired additional interest in our eyes at every watercourse we crossed, for the intervening scrubby country showed nothing more remarkable than the occasional outcrop of red sandstone, in a gravelly, sandy soil. At three miles and a half from our last camp we crossed a river, in pools one hundred yards by twenty, and perfectly fresh, running slowly to the S.S.W., between banks which frequently broke into red and yellow sandstone cliffs. On examining these, and the interesting *débris* at their feet, the prospects of coal being not very remote, were greater and more encouraging, for we seemed to have got much lower in the carboniferous strata than in the stream-beds to the eastward. Flaky ironstone, of a hard, flinty texture, was found at a low level, together with pebbly concretes; and layers of water-worn pebbles were also imbedded in the cliffs. Amongst the *débris* of stones and gravel in the river's bed, were fragments of slate, flint, and apparently chalk, the same being also imbedded in the rocky bank. From this spot, the sharp-peaked summit of the lofty rocky range in advance bore

W. 10° S., about fourteen miles distant, and towards it we shaped our course, crossing three more streams of smaller size, and fresh, running to the southward in grassy valleys, the developments in which made us long to linger on spots so geologically interesting; for in some of them the slaty coal-shales appeared, and were closely traced as far as visible.

The intervening ridges were high, steep, and rocky, and well covered with thicket and scrub, which appeared also to continue on the lower grounds, as these hills broke off into a descent half a mile to the south.

The horses' feet now suffered so much from the extreme roughness of the rocks, the sharp, knife-like edges of which in many places required the greatest care in avoiding, that I did not regret when a valley, deeper and wider than the others, at length lay at our feet, and promised to afford them a respite on its well-grassed flats. Descending its steep and rugged slope, we encamped at four o'clock, in the midst of luxuriant grass, in a valley half a mile wide, through which was winding, in a very tortuous course, the river which "Bob" had described to us as draining the eastern side of the range. Here the scenery was altogether rich and beautiful, such as, in contrast with our former scrubs and thickets, we seemed never tired of contemplating. It was however limited, and the effect chiefly produced by the abutment into the rich grassy valley of several small projections from the higher land, composed entirely of fragments of red sandstone, quartz, and thin scales of micaceous slate, of every hue and colour. These projections, and their intermediate little grassy ravines, were beautifully studded with wattles, and small ornamental trees; and above all rose a dense mass of dark green foliage, reminding us but too forcibly of the impenetrable thickets with which we had contended in the interior.

As the morning of this day had been wet and stormy, with much thunder and lightning from the S.E., and clouds were again piling up in heavy masses, threatening a continuance of the storm, I avoided all trees and conspicuous objects in selecting our camp; and fortunate it proved that I did so, as before the sun went down, a thunder-storm, which had been gathering in the N.W., burst furiously upon us from the opposite quarter, and would have swept everything before it, had we not been sheltered by a little thicket of saplings. This continued, and even increased, and until early morning we seemed to be the sport of one continued black thunder-storm, passing from S.E. to N.W., and *vice versâ*. The lightning gleamed and darted about us most vividly,

and the sharp cracks of thunder seemed to be in our very presence, and to explode close by us. The rain did not fail to play its part either; and by the time all was over, our ammunition (in waterproof canisters) was the only article left dry, for our frail calico tents might as well have been struck at the onset.

At daylight nature smiled out upon us, as if nothing had happened; and upon the same principle we proceeded on the labours of the day, as soon as we could dry some clothes, and had looked about for the damage done by the elements; but beyond the leaping and brawling of the water-channels around, and the occasional grumbling of the distant thunder, no vestige appeared of the recent storm.

On examining the river one hundred yards to the westward, it was found to be in deep open pools of considerable size, formed entirely out of a light-coloured greenish rock, laminated and stratified. Its lay was E. 30° N. and W. 30° S., with occasional deviations, amounting to 10° or 15°, and the dip was estimated at about 60° to S. 30° E. Thin veins of metamorphic ironstone traversed the strata, without any regard to order or arrangement; and to all appearance the whole of the adjacent range was of the same formation, its naked rocks being plainly visible to the eye.

Mr. Gregory, in following up the river's bed a few hundred yards, having found some loose pieces of micaceous slaty rock, apparently coloured black by a bituminous substance, and resembling a slaty coal, we proceeded on our examination of the river upwards, with renewed hopes; and at a part of it, three-quarters of a mile west from the last bivouac, came upon shales of a promising character in the bed, of a deep slate colour, approaching to black, and apparently bituminous, with thin veins of still darker substance, like coal, between the layers. The direction and dip of the strata were as before stated, and the sides of the steep hills which rose from the river's bed were strewed with fragments of the same slaty appearance, but more hardened by exposure to the atmosphere.

The rains of the previous night had unfortunately filled all the lowest levels in the river's bed, and had also set it running, as well as every adjoining tributary. The bed was likewise so encumbered with rocky fragments among the deep pools, as to render our search difficult, tedious, and incomplete, for at the time it was in progress, the horses were struggling and floundering across the rich grassy peninsula formed here

by its right bank, where the land lay very low, and had been rendered soft and boggy by the rains. I therefore felt desirous of securing for them a firmer footing on the higher ground, and for this purpose cut off angles of the river which would otherwise have been more fully examined.

As we proceeded upwards, the obstacles and impediments near the river increased, and I found it necessary to withdraw the horses altogether from its vicinity hereabouts, while able to do so. While therefore Messrs. Gregory and Ridley traced its bed, I conducted the party through the dense masses of thicket we had seen from our camp, as the only means of getting above some steep rocky cliffs which occurred on the western side of them. By the time these were cleared, at the expense of much scratching and tearing, the party from the river's bed rejoined us, and reported they had fallen in with coal shales, if not the actual coal itself, of far superior quality to that already noticed, and that it lay in large blocks in the river's bed. Not being aware of this till we had long passed the spot, I did not see it, but continued my search for some grass, and a proper camping-place, the horses being greatly fatigued with their harassing hill work, and some of them very footsore.

Ascending a peaked rocky hill two miles north from the range, the river was observed to occupy a very steep rugged valley in the intermediate space, and to be in large pools. Above this it was observed to wind through extensive grassy slopes from the N.N.W. and N., its numerous tributaries being also well grassed, and the principal valley, fifteen or eighteen miles off, in the direction of N. by W. One of these tributaries, not so grassy as the others, seemed to cut its way almost wholly through a red sandstone country, and could be traced by its cliffs many miles to the W. and N.W. from its mouth, a little above the hill we were upon. Several lofty and abrupt hills, of varied and peaked outline, were observed between East and Middle Mounts Barren, and the latter itself appeared at the distance of thirty miles on the bearing S. 50° W. All these hills seemed to be composed of the same light-coloured micaceous slaty rock as that which formed the range near us.

Having given to the latter the name of Mr. Eyre, the indefatigable explorer, who was the first to report its existence, we descended from our rugged elevation, and encamped two miles further to the westward, a little above the mouth of the tributary already noticed with the red

cliffs. Here grass and water were abundant, and the rock chiefly red sandstone conglomerate, mixed with slate, and a variety of others, in loose and promiscuous heaps.

At this camp we seemed to have got quite above, or to the N.W., of the main coal-seam of this river, which will in all probability be found to crop out in its bed between half and one and a half mile, in a direct line above our bivouac of 20th December, from which East Mount Barren bore S. 28° 45′ W., and the north end of Eyre Range W. ½ S. I should even now have proceeded on foot for its further examination, but Bob assured me it was not the spot in which his friends had told him coal was to be found, and to which he was very desirous we should proceed without delay.

I have been thus particular in describing my passage across this coal field, in order that others who may hereafter follow up the discovery may be fully aware of what has been left incomplete. That coal exists in the locality pointed out, there cannot remain the slightest doubt; for although the later specimens were so unfortunately lost, sufficient were seen and brought away from the neighbourhood to place all doubts aside, and I have little fear but this valuable mineral will be found in considerable quantity where I have stated. Its locality is favourable, at eight or nine miles from the sea-coast, and perhaps five or six only from the head of an estuary, which was seen at a distance to receive the river on the eastern side of East Mount Barren. This estuary (which was named Culham Inlet, and its river the Phillips) is probably navigable for boats for a few miles, but, like all the inlets on the coast, is doubtless shut up by a dry sand-bar at its mouth, except during a small portion of the rainy season. This bar, and the anchorage off it, would be only fifty miles from the southern part of Doubtful Island Bay, where steamers might coal in security from a depôt.

(To be continued.)

Notes on the Botany of King George's Sound.

[The following extracts of a letter from Dr. Harvey, dated King George's Sound, January 29, 1854, will, we are sure, be read with pleasure by those who peruse this Journal.—Ed.]

I wrote to you from Ceylon in November, enclosing specimens and

descriptions of my "*Vanvoorstia*" and the new "*Claudea*,"* and I hope you duly received the letter; it was sent by the Governor's despatch-bag through the Colonial Office. I left Ceylon on the 13th December, and arrived here on the 7th of the present month. We touched for a few hours only at Penang and Sincapore. At the latter place I drove out to Dr. Oxley's country-house, very prettily situated a mile or two from the town; but unfortunately the Doctor was not at home, and though I followed him to an institution where he was said to be engaged, I missed him there by half an hour, and was then obliged to go on board the steamer; I left your letter for him, however. He has a very pretty garden round his house, and several choice plants therein; and under a tree near the house were placed a considerable number of Epiphytes, among which the *Phalænopsis* and some *Ærides* were in blossom. Sincapore is beautifully situated; and its many bays, harbours, and small islands ought to afford good *Algæ* ground, had my arrangements allowed my stopping. But I was anxious to be out of the tropics, and to arrive in Australia before the summer was quite past, and also to proceed by the steamer "Madras"—she being the best on the line, and the one following being a small boat, crank, and likely to be overcrowded. So I left Sincapore, and we steered for Batavia. Here we anchored six miles from shore, and were prohibited landing, as we only stopped to drop the mails, and were told we should sail again in four hours. It so happened that we were detained eight or nine hours by the slowness of the Dutchmen, but it was then too late to land. It was Christmas day. Several native boats came round us with fruits, etc., and I had thus the opportunity of eating Mangosteens and testing their quality: after the very high praise I had heard of them, I was rather disappointed, but probably when eaten fresh from the tree they may be better. It is a very *delicate* fruit, and notwithstanding its thick rind, does not keep long without deteriorating. By the way, I prefer a good English peach or a Jersey pear to all the fine fruits I have *yet* tasted in the tropics; but I was not in the *Mango* season, and I am disposed to think favourably of the best varieties of that fruit, from the memory of having tasted one in 1839 at St. Helena. The whole of the way from Sincapore to King George's Sound we had contrary winds, and, though with engines of 270-horse power, had to deviate considerably to the westward of our proper course. The only

* Figured and described in the present volume of our Journal.—Ed.

land we saw between Java and Australia, was Christmas Island, which we passed on St. John's day. It is covered with small trees and shrubs, but that is all I can tell you of its Flora. On the 6th January we came in sight of Australia, close to Cape Entrecasteaux, about 100 miles to the west of King George's Sound; and we came from thence at about an average distance of five or six miles from the coast the whole way to Bald Head. It was poor-looking enough;—granite headlands, often quite naked; when not so, covered with low brown-looking scrub, interchanging with patches of white sand. The distant hills appeared wooded; smoke was rising here and there, and when night fell we saw bush-fires blazing in many directions, and some of them of miles in extent. This was my first personal acquaintance with the bush-fire; but since I have been here, we have had them all round the town, and Mount Clarence (which overlooks us), which was covered with flowering shrubs when I landed, is now clothed in black sticks and ashes.

Before I had been an hour on shore, I had (of course) picked up *Cephalotus*, which is abundant in all the boggy ground I have yet visited, and just now in flower. As the town is built partly on bog and partly on sand-hills, I had not far to go for a specimen; *Marchantia polymorpha* was growing with it. On the *shore*, my first "find"—also immediately on landing—was the famous *Fucus peniculus** of R. Brown. It is of all sea-plants the very commonest here, occurring all round the shore at a depth of two or three feet, and being washed in abundantly whenever it blows (as it does generally ten hours per day). The plant grows *always* (so far as I know) on dead shells,—generally single valves of *Venus*, or mussel and oyster shells. Now, is this because it wants lime, to manufacture its lime-coated stem? and is it a proof that seaweeds *do* imbibe nourishment from the rocks they grow on? There is no limestone at this side of the Bay. I have made a sketch from a living specimen for future figuring, as Turner's figure omits many important characters. I have also found its *spores*, which are remarkably large, and with very hard and tough coats. At first, every little bag is filled with green matter, like that of *Codium* or *Bryopsis;* afterwards this matter is wholly converted into spores, which are discharged on the bursting of the membranous bag. As a

* On the very day on which I received this letter, I had the opportunity of speaking of it to Mr. Brown. His first remark was, "No doubt he found *Fucus peniculus*."—Ed.

genus, *Polyphysa* is closely related to *Acetabularia*, and I make no doubt of the truly vegetable nature of both.

King George's Sound is by no means a favourable locality for *Algæ*. During the three weeks that I have been here, though I have collected and dried about 2500 specimens, I have not more than about 70 species, and of many of these only fragments or a few scraps. The *Florideæ* are particularly few, and badly coloured,—those that ought to be rose-red, being oftener dull yellow or "French white." There are very few green; only three *Confervæ*, and very little even of the common *Ulva* and *Enteromorpha*. The *Olive* colour is predominant in the *masses*, but a vast deal of it consists of a slender *Dictyota*. There are several *Fucoid* plants, but scarcely one of them in a state of maturity; they appear to be all winter fruiters, and are not worth collecting at present. Several English kinds are here, as *Asperococcus Turneri*, *Stilophora Lyngbyæi*, *Dictyota dichotoma*, etc. On the other hand, many of the most abundant and characteristic Australian types are wanting. Of *network* Algæ, I have yet only got *Thuretia*, *Halophlegma*, and *Hanowia*,—the latter in very small quantity, and both the others very badly coloured. I hope I may meet better collecting grounds elsewhere, otherwise I shall do badly.

Here, at King George's Sound, I am much too late for the phænogamous botany. October and November are the months for flowering plants; December is also good; but by the end of January, three-quarters are past their bloom. The *Restiaceæ*, which I meant to have studied, are all dry as thatch. There are very few *Compositæ* to be seen, at which I wonder much, but am told their great region is at the Leschenault. The scrub here is made up of *Proteaceæ*, *Leguminosæ*, and small *Leptospermeæ* and *Epacrideæ*. The *Epacrideæ*, chiefly white *Leucopogons* and *Lysinemas*, are so abundant in individuals as to afford the chief mass of flowers in many places; after them the *yellow Leguminosæ*. The *purple* and *blue Leguminosæ* are now in seed; their time was December. Trees of *Kingia* (just coming into blossom) are abundant and very grotesque; they vary from five to twenty feet in height. The *Xanthorrhœas* here are small, with stems not more than three feet in height, and often much less. The forest-trees are not of great size; the larger *Banksias* especially ugly *as trees*, from their clumsy and distorted branches and rigid brown foliage: the younger ones may be allowed to pass, especially when in flower, as many now

are. I have not collected specimens of them !—do not cry "shame !" All the *Dryandras* seem out of flower, and so are *Synaphææ*. *Franklandia* is very common, sad-coloured, and tolerably scented : I shall try for seeds of it, but it seems little disposed to make them. *Lambertia echinata* is the only one of the genus I have yet met with, and it is nearly out of blossom ; I have gathered a few seeds of it. A few *Stylidia* remain, but many are withered up. The climate here is very much colder than you would suppose by the latitude. This is the hottest month of the year, yet I have not seen the thermometer above 74° in the house, with open windows, at the hottest part of their hot days ; and it is much more frequently 68° or 70°. The sky has been clouded for three out of four days since I have been here. We have had rain three or four times, and several evenings a fire was quite pleasant ; and I sleep under two blankets, and usually a counterpane besides. It almost always blows (often strongly) from ten o'clock in the morning till sundown, and sometimes all day and night. Westerly and S.W. winds (both cold ones) prevail. I should think most of the plants here ought to bear the open air in Devonshire, or south of Ireland. They say the summers are only six or eight weeks long, and the rest of the year is noted for high winds and abundant rains. At present the plains are tolerably dry, but in winter what is not *sand* is spongy *bog*. The summers are scarcely long enough to ripen grapes, and none but very early kinds, such as often ripen out of doors in England, will ripen. A few apples, with Cape gooseberries, are all the fruit I have seen. Pears there are, and figs ; but unless every individual fruit is tied up in a bag, it is eaten up by the cockatoos. Then almost all the pastures are poisoned, so that sheep and cattle cannot be kept at large ; and consequently meat is 8*d*. per lb. in the market, and not always to be had. *Gastrolobium bilobum* is the worst of the poison shrubs here, but almost every district has its own plague, and many of them are *Leguminosæ* ; so that I do not recommend you to emigrate to this settlement. Yet, King George's Sound is very prettily formed,—sloping hills, broad valleys, a perfectly land-locked and capacious harbour, and a wonderfully beautiful vegetation in the proper season, as I am told and can well believe. I hope my next letter will have more to tell. Ask Joseph to write to Gunn, saying I hope to be at Launceston in September or October ; and let him urge the Port Davy expedition.

W. H. HARVEY.

BOTANICAL INFORMATION.

Dr. Wallich.

The pages of our Journal were already printed, last month, when we received the melancholy tidings of the death of our inestimable, long-tried, and learned friend, Dr. Wallich, M.D., F.R.S., Vice-President of the Linnean Society, Knight of the Danish Order of Danebrog: a name that will be loved and honoured so long as botanical science shall continue to be cultivated. His persevering and arduous services and literary labours, in unhealthy tropical climates, gradually undermined his constitution and induced organic disease, which, after two or three months' confinement, terminated fatally, at his house in Upper Gower-street, on the 28th of April, at the age of 68. Few men, if any, of the 19th century, have done so much to further the cause of botany throughout the world as Dr. Wallich. Placed, by a series of unforeseen circumstances, at an early age, at the head of the East India Company's Botanic Garden, at Calcutta, he had such means at his disposal for studying and dispensing the vegetable riches of India and of other countries, as have never been at the command of any single individual before or since. But for his munificent contributions of Palms and other glories of tropical vegetation, the great conservatory of the Duke of Northumberland, at Syon, would never have been required; but for them, the extraordinary talents of Sir Joseph Paxton would never have been displayed on the yet unrivalled Plant-house at Chatsworth (the model of the "Crystal Palaces"), or those of Mr. Decimus Burton on the Palm-house of the Royal Gardens at Kew. In all these structures we have but to look around for monuments of his intelligence, energy, and liberality.

The Journals of the day, especially the 'Gardeners' Chronicle' and the 'Literary Gazette,' have briefly recorded his worth, and the services he rendered to science. Dr. Wallich's extensive correspondence in connection with the Calcutta Garden has been bequeathed by him to the library of the Royal Gardens of Kew; and this, it is hoped, will furnish data and information for a little Memoir, which it will be a duty to prepare for an early number of our Miscellany.

Mr. Swainson's Botanical Report, *principally relating to the Eucalypti and Casuarinæ of* Victoria, New Holland.

It has been a real pleasure to us to lay before our readers (see p. 123) the able Report of the Government Botanist of the Colony, Dr. Müller, on the vegetation of Victoria. The late Lieutenant-Governor, Mr. Latrobe, in his great desire to promote the cause of botany, appointed also another naturalist, W. Swainson, Esq., well known as a distinguished zoologist and most able draughtsman, to study and report on the timber of the colony, chiefly *Eucalypti* and *Casuarinæ*. By favour of his Grace the Duke of Newcastle, the Report is now before us, and it is as brief as it is startling in some of its statements. It is as follows (addressed to the Lieutenant-Governor):—

"Tirhatuan, 2nd October, 1853.

"Sir,—I do myself the honour of laying before your Excellency, in the enclosed papers, the result of my botanical investigations in this province.

"My chief attention, for the first five months after being located here, was directed to the family of *Eucalyptidæ*, or Gum-trees, among which I have discovered five distinct and well-marked genera, hitherto unknown as such, and apparently peculiar to Victoria; together with two other new genera, which occur also in the adjacent province.

"Having had no accommodation for arranging the different species for comparison, etc., I have been necessitated to pack them up as fast as collected. It is quite impossible therefore for me to state, with any degree of certainty, the number of new species contained in the above genera. The packets of dried specimens, seeds, and capsules, will be seen to form a grand total of 1520. I am therefore disposed to think, that even if two-thirds may hereafter prove varieties only, there will yet remain more than 500 species, botanically distinct, only two or three of which I have found in New South Wales.

"My researches, in respect to timber-trees (from causes already well known), have been quite unsuccessful. The Red Gum (*Canthocarpus*, La.*) and the straight Stringy Bark (*Tricanthus*, La.) are the only genera I have found whose wood is useful either for sawing or splitting. Specimens of the former (of an unknown species) have been procured and sent to the curator. The latter, of which there are numberless

* Latrobe?—Ed.

species, and a few of that of *Microcarpus*, or Native Box, are mostly used for fencing. No reasonable doubt however can be entertained that other parts of the province are more productive than this seems to be of valuable timber; and as the Colonial Botanist has had the requisite facilities at his disposal for ascertaining this fact during his extensive excursions, he will doubtless have succeeded far better than myself in developing the *economical* properties of the Victoria timber-trees.

"During the last year I have made various attempts and experiments to discover the principles of variation amongst the *Cassuarinæ*, vulgarly called He and She Oaks, but which in reality are the true *Pines* of Australia. It was only in June last however that this discovery was effected, and the conviction then arrived at, that all the descriptions now existing were perfectly and essentially defective, and therefore *quite useless;* and that this and the genus *Exocarpus* are the most extraordinary groups of trees yet discovered in Australia. Without being further tedious (as I intend to bring this discovery before the public in another shape), I shall merely state to your Excellency, that the facts I am prepared to bring forward will establish the following propositions:—

"1. That the Australian *Pines* belong more to a very remote or primeval Flora than to the present.

"2. That they are slowly, but *surely, disappearing* from the face of the earth, and giving place to that comparatively recent order of vegetables which springs up in their stead. In this respect they offer a wonderful analogy to what we have ourselves witnessed in regard to the aboriginal tribes of Australia now giving place to those of the Caucasian race.

"Now, of this remarkable tribe I have succeeded in determining more than *two hundred* species, all still growing within a very short distance of this place, besides having met with several others in different stages of decay, but which, from their bark and other indications, convince me were different from all those I have met with in a *growing* state. They have, in fact, died from excessive age, and have left no successors.

"In the accompanying paper is a list of all the species found by me up to the end of the last month; and an abundance of cones of nearly all these have been collected and sent to the curator of the Botanical Garden. These your Excellency may now cause to be distributed and made known over the whole civilized world: and thus the Botanical Garden would probably receive from those established at the Cape, Rio de Janeiro, Calcutta, Ceylon, etc. etc., more rare and costly plants, in

exchange, than would fill five such conservatories as that now building at Melbourne. I should also suggest, that as most of the species are handsome, and many beautiful growing trees, half an acre or so of ground be appropriated for a seed-bed, by which a large number of young plants might be raised, ready to transplant into the projected shrubberies round the Government House, and to distribute among such private individuals as may wish to possess some few examples of these aborigines of the vegetable world.

"To establish these discoveries upon the most solid basis, I have given up nearly a month of my engagement with the Tasmanian Government; for, without having laboured, I may say truly, both day and night for the last three months, I could not have brought the matter to such an unquestionable issue. Without taking too much credit to myself, I feel satisfied that these discoveries will be regarded with as much surprise and almost incredulity amongst the botanists of Europe, as was that of gold in Australia among the geologists of Britain. Of all those named in the list I possess elaborate descriptions, partly written with the trees before me, and finished before the cones had opened, and thus lost their specific characters. As there exists no scientific society or other medium for publishing an essay on these trees in Melbourne, I think the Royal Tasmanian Society (of which I am an honorary member) will gladly do so in their own transactions.

"I have the honour to be, etc.,

"(Signed) WILLIAM SWAINSON, F.R.S."

This singular production is followed by "A Schedule of the Botanical Collections made by Mr. Swainson, for the Victoria Government, and delivered to the Curator of the Botanic Garden, Melbourne," and is no less worthy to be recorded than the above Report.

"EUCALYPTIDÆ.

I. Dried specimens of the Sprigs, in separate papers, the different genera (all new), or the principal divisions of the family, marked on each. These, altogether, amount to *five hundred and sixty-four*, and are arranged in four distinct series, as under:—

1st Series. Marked with single numbers, and to which the drawings refer, in all 68

2nd Series. Alphabetically numbered from A 1 to A 12 . 297

3rd Series. The number enclosed in a circle, thus (1) . . 160

4th Series. Species growing on the Government domain, the

respective numbers corresponding to those marked on the trees 39
——— 564

II. Species and Varieties contained in small paper bags, labelled as above, each containing Capsules, Leaves, and (where procurable) Seeds and Buds. These, together, amount to *nine hundred and thirty*, and are arranged in the above manner, viz.:—

1st Series. With single numbers	33	
2nd Series. Alphabetical, A 1 to A 12	167	
3rd Series. In a circle (1)	691	
4th Series. From the Government domain	39	
	———	930

III. Papers of Sprigs, (and separate ones) of the Capsules, etc., collected on the Blue Mountains, New South Wales 26

Total of Species and Varieties 1529

PINES.

A series of large bags and tin cases, numbered and named, of all the species of *Cassuarinæ* examined and determined from 26th July to 29th September (a few separate packets of unexamined species) 201

A series of large bags and tin cases of my new genus *Echinocarpus*, or Grass Pines, numbered and named 21
——— 222

Grand Total of Species and Varieties 1732

DRAWINGS.

Two Portfolios, with drawing and Dissections, natural size, and magnified, of different species and genera of *Eucalyptidæ*. Notes to the above.

P.S. A small packet of seeds of the finest timber-trees of Illawarra.

Having had no convenience for opening and sorting the New South Wales collections, that portion intended for the Victoria Government will be sent from Hobart Town, where every accommodation I require is promised.

The drawings will be personally delivered to the Curator before I leave Melbourne.

LIST *of* SPECIES *of* Cassuarinæ, *or* Australian Pines, *discovered, named, and described by* MR. SWAINSON, *and of which Seeds and Cones* (*mostly in abundance*) *have been collected for the Victoria Government.*—N.B. In several instances *different* species and numbers appear under the same specific name. All these must therefore be considered *provisionary*, and arose from not keeping a memorandum of the names I had already used. Without a single book to refer to, I have been obliged to leave several of the latter species *unnamed* (although described), from having exhausted all the specific names I can think of, that were at all applicable to the species."

This singular document concludes with a catalogue of Latin and English names, numbering 213 species of *Casuarinæ*, "several," as the author tells us, "including other species," all new, and all named and described by Mr. Swainson "without a single book to refer to"!

Botanical News from Italy.

Florence, April 15.

The second part of Professor De Notaris' 'Agrostographiæ Ægyptiacæ Fragmenta' has appeared; fifty-four species are therein described and figured, the greater number of them being considered as new. A new genus, *Eriochœta*, is established among the *Paniceæ*. The genus *Beckera*, Nees, non Fresen., is given under the name of *Beckeropsis*.

Professor Joseph Bertoloni has published a third Dissertation on the plants of the coast of Mozambique. After noticing the state of agriculture in that country, he gives descriptions and figures of three medicinal plants, viz. *Lepipogon obovatum*, Bert. (a new genus of *Boragineæ*), *Cassia acutifolia*, Delill., and *Chibaca salutaris*, Bert.

In the last number of the 'Rendiconto dell' Accademia delle Scienze,' of Naples, M. Gasparrini has made known the results of his observations on the disease of the Tomato (*Lycopersicum esculentum*, Mill.). It made its appearance together with the potato-disease, and is, it would seem, also accompanied by the presence of the *Botrytis infestans*.

Under the title of 'Flora Melitensis,' M. Grech-Delicata has published a catalogue of the phænogamous plants, 716 in number, which are found wild in Malta. To the scientific name of each plant are added the place where it grows, the time in which it flowers, the Maltese vernacular name, and sometimes a synonym.—*Bonplandia.*

Podostemon Salt: a Saline Ash, from Podostemaceæ.*

In the letters we are publishing from Mr. Spruce, relating to his Ex-

* The *Podostemaceæ* are a family little known, except to the students of tropical botany. They abound especially upon rocks in the falls and rapids of South America, many of them having a good deal the appearance of some *Marchantiæ* or *Jungermanniæ*, others of green *Algæ*. The most delicious fish are said to fatten upon them; cattle frequent the rocky beds of the streams in the dry season, and feed upon species of the genus *Marathrum*, according to Mr. Purdie; and Sir Robert Schomburgk relates the fact of a considerable quantity of salt being obtained from the ashes of a species of *Lacis* (*Mourera*, Tul.). M. Tulasne has admirably illustrated the genera and species of this remarkable family of plants, whose place in the system is still very dubious, in his work entitled 'Monographia Podostemacearum.'

cursions on the Amazon and Rio Negro (p. 34 of our present volume), he speaks, as among the most interesting articles he has sent home for our Museum, of a quantity of salt (weighing thirty pounds when put up) made from various species of *Podostemaceæ* growing on the cataracts of the Uaupés; it was obtained with considerable difficulty, at several times, and of several different Indians. Mr. Hanbury has been so obliging as to refer us to the eleventh volume of the 'Pharmaceutical Journal' for an analysis of a saline ash, from British Guiana, which undoubtedly has the same origin, although the particular plants which yield that ash were not known till we received the present communication from Mr. Spruce.

The analysis in question is by Mr. Graves, who gives the following account, *l. c.*:—

"Among the interesting specimens exhibited at the late Great Exhibition, from British Guiana, and presented to the Pharmaceutical Society, was one labelled 'Saline Ash,' which is said to be used by the Indians as a substitute for salt. This ash, in the state we have it, is in black pulverulent masses. It is said to have been obtained by burning certain plants growing on the rocks near the rapids, about a thousand miles up the river Demerary.

"The salt is very easily obtained from the ash, by treating it with cold water, and evaporating the solution to dryness. Seventy-five per cent. of soluble saline matter may thus be extracted, the insoluble residue consisting of carbon, siliceous matter, carbonate of lime, and insoluble phosphates, in the following proportions:—

Carbonaceous matter	31·
Siliceous matter	44·2
Carbonate of lime and insoluble phosphates . .	24·8

"The salts soluble in water were found to consist of chlorides of potassium and sodium, together with a portion of alkaline carbonate and a small quantity of sulphate. It was tested for iodine, but there was none found. 100 grains of the dry salt gave—

Sulphuric acid	1·0 grs.
Carbonic acid	4·4
Chlorine	45·648

"Now assuming the sulphuric and carbonic acids to be in combination with potash, we should have 84 grains of the chlorides of potas-

sium and sodium; and as those contain 45·648 grains of chlorine, we may deduce the following composition of the salt by calculation:—

Sulphate of potash	2·18
Carbonate of potash	13·82
Chloride of potassium	33·6
Chloride of sodium	50·4
	100·00

"From the above results, it will be perceived that the peculiarity of this vegetable ash consists in the large amount of chlorides contained in it, which very well adapt it for the purpose to which it is applied, and render it a tolerably good substitute for that essential substance, common salt."

NOTICES OF BOOKS.

HANSTEIN, DR. JOHANNES: *Die* GESNERACEEN *des Königlichen Herbariums und der Gärten zu Berlin, nebst Beobachtungen über die Familie im Ganzen.* With 2 plates. (From the Linnæa.)

This work is in the form of a pamphlet in 8vo, containing 71 pages. Of these 52 are devoted to general observations on the family of *Gesneraceæ*, and the remainder to synoptical tables of the tribes, subtribes, and genera; where the several species above alluded to are divided into 68 genera. Whatever may be the opinion of the necessity of multiplying the genera to such an extent, and, as it appears to us, often on very slight grounds, the author has illustrated his meaning by excellent figures of at least one of each genus. Rich as the Garden and Herbarium at Berlin may be in individuals of this, we cannot but think that, had Dr. Hanstein consulted other sources he would have found reason to modify some of his views, and that he might advantageously have reduced the amount of his genera.

SCHUCKARDT, T.: *Synopsis* STACKHOUSIACEARUM. (From the Linnæa.)

To this natural family, already embracing two genera, *Stackhousia* and *Tripterococcus*, our author adds a third from the island of Rottenest, off the west coast of Australia, *Plokiostigma; P. Lehmanni*, Schuck. Three new species are contributed to the genus *Stackhousia*, and one to *Tripterococcus*.

Notes on North Brazilian GENTIANEÆ, *from the collections of* Mr. Spruce *and* Sir Robert Schomburgk; *by* GEORGE BENTHAM, ESQ.

SCHUEBLERIA, *Mart.*, et APOPHRAGMA, *Griseb.*

I have carefully examined the original specimen in the Hookerian Herbarium marked by Grisebach *Apophragma tenuifolium*, which exactly corresponds with those I described as *Schuebleria coarctata*, and certainly has pentamerous as well as a few tetramerous flowers, and an oblong-linear stigmate, like that of *Schuebleria patula**. The description of a broadly bilamellate stigmate, and of appendiculate filaments, must have been taken by Aublet himself, as well as by Grisebach, from the analyses represented at tab. 26, fig. 4, 5, 6, and 7 of the 'Plantes de la Guyane,' which belong to fig. 1, *Exacum Guianense* (*Schuebleria tenella*), not to the fig. 2, *Exacum tenuifolium* (*Schultesia*).

A further examination of numerous specimens from various parts of tropical America has convinced me that the two plants I had described as *Schuebleria tenella* and *coarctata* are, notwithstanding some slight differences in the anthers, mere varieties of one species of *Schuebleria*, distinct indeed from the *S. tenella* of Martius, which I had not then seen, and which is accurately described with a globose stigma, but identical with the *Exacum tenuifolium* of Aublet, correctly referred to *Schuebleria* by Don. I would characterize it as follows:—

Schuebleria *tenuifolia* (Don, Gen. Syst. vol. iv. p. 202); caule filiformi, foliis parvis oppositis linearibus v. imis ovatis, cyma multiflora, calycis segmentis capsulam superantibus, corolla calyce vix dimidio longiore, antheris liberis, stigmate oblongo-lineari.—*Exacum tenuifolium*, Aubl. Pl. Guy. p. 70. t. 26. fig. 2, et 9, 10.—*Apophragma tenuifolium*, Griseb. Gent. p. 163, et in DC. Prod. v. ix. p. 56.—*Schuebleria tenella*, Benth. in Tayl. Ann. Nat. Hist. vol. ii. p. 442, non Mart., et *S. coarctata*, Benth. l. c.—*Corolla* ex Aubl. violacea, ex Spruce et Schomb. flavescens v. alba, ex Gardn. pallide rosea. *Antheræ* discretæ, loculis angustis approximatis nunc apice v. basi acutis nunc utrinque obtusis.

My specimens were gathered at Tocotepeque, in Central America (Hartweg), in French Guiana (Leprieur), in British Guiana (Rob.

* The capitate or oblong stigma of *Schuebleria* appears to consist, in fact, of two laminæ closely connate, which sometimes separate slightly after the flower has withered, but never spread horizontally.

Schomburgk, 1st coll. n. 167), in exposed gravelly situations in the serras near Santarem, on the Amazon (Spruce, distributed as *S. tenella*, var. *fl. albis*), in marshy sandy places near Oeiras, prov. Piauhy (Gardner, n. 2668), and near Arroyas, prov. Goyaz (Gardner, n. 3892).

Gardner's n. 4280, from Goyaz, is *Schuebleria patula*, Mart., and n. 3338, from Goyaz, and 5021, from Minas Geraes, are *S. stricta*, Mart.

The following new species, approaching in stature the *Schuebleria stricta*, but differing considerably in the foliage and flowers, was gathered by Mr. Spruce on the margins of inundated campos at Uananaca, near San Gabriel, on the Rio Negro, in North Brazil, in December, 1851.

Schuebleria *obtusifolia*, sp. n.; foliis oppositis ovatis obtusissimis trinerviis, cyma floribunda, corollis (minimis) calycem paullo superantibus, antheris subconnatis muticis connectivo parvo, stigmate subgloboso.—*Caules* erecti, pedales, infra cymam foliatam simplices. *Folia* intermedia 4 lin. longa, 3 lin. lata, basi arcte sessilia v. amplexicaulia. *Flores* albi, vix $1\frac{1}{2}$ lin. longi. *Calycis* segmenta setacea. (Spruce, coll. n. 2011.)

Tapeinostemon, gen. nov.

The two plants for which I propose to establish this genus are both from the neighbourhood of Panuré, on the Rio Uaupés. They are allied to the small-flowered *Schuebleriæ* in their calyx, corolla, and stamens, but have a very different foliage, habit, stigmate, and capsule, and at first sight remind one rather of some herbaceous *Melastomaceæ* or *Rubiaceæ*, than of the majority of *Gentianeæ*.

Char. Gen.—*Calyx* parvus, 5-partitus, segmentis exalatis. *Corolla* subinfundibuliformis, tubo lato, limbo brevi 5-lobo. *Stamina* 5, corollæ tubo prope basin inserta. *Antheræ* hastatæ, connatæ, inclusæ, immutatæ. *Ovarium* valvulis introflexis biloculare. *Stylus* brevissimus v. subnullus, stigmate brevi bilamellato. *Capsula* calyce multo longior, oblonga, bisulca, bivalvis, septicida, semi-4-locularis. *Semina* numerosa, tuberculata.—*Herbæ* Brasiliæ borealis annuæ erectæ ramosæ, foliis longe petiolatis membranaceis triplinerviis, cymis multifloris divaricato-thyrsoideis v. capitato-contractis.

1. Tapeinostemon *spenneroides*; foliis ovato- v. oblongo-lanceolatis, cymis divaricato-thyrsoideis.—*Herba* sesquipedalis, erecta, ramosissima,

glabra, superne leviter viscidula. *Folia* 2½–3½-pollicaria, acuminata, basi acuta, margine sæpe crispula v. fere erosa, tenuiter membranacea, utrinque viridia, tri- v. triplinervia et pennivenia. *Cymæ* laxæ, pyramidatæ, vix folia suprema excedentes, ramulis divaricatis. *Bracteæ* ad ramificationes parvæ, lineares. *Pedicelli* ultimi 1–2 lin. longi. *Calyx* minimus, segmentis acutis. *Corolla* vix linea longior, albida, limbi laciniis brevibus latis acutis. *Stylus* brevissimus, lobis stigmatosis ovatis brevibus. *Capsula* anguste oblonga, 2½ lin. longa, leviter bisulca, acuta v. stylo omnino deraso obtusata.

A single plant of this was found by Mr. Spruce by the side of an igarapé, deep in the forest near Panuré, in September, 1852.

2. Tapeinostemon *capitatum*; foliis oblongo-lanceolatis utrinque acutis, cymis capitato-condensatis.—*Herba* semipedalis, erecta, simplex v. ramosa, glabra. *Folia* subtripollicaria, acuminata, basi in petiolum longiusculum angustata, integerrima, crassiuscule membranacea, trinervia, nervis lateralibus tamen tenuibus, venulis vix conspicuis. *Flores* in capitula globosa intra folia suprema breviter pedunculata dense conferti, bracteis parvis intermixti. *Calyx* vix lineam longus, segmentis angustis acute acuminatis. *Corolla* fere 2 lin. longa, albida. *Stylus* vix ullus, lobis stigmatosis brevibus ovatis subsessilibus. *Capsula* ovoidea, calyce vix dimidio longior, obtusata, leviter compressa et bisulca.

In moist caatingas near Panuré, October, 1852. (R. Spruce, n. 2493.)

Voyriella, *Miq.*

Of this little plant Mr. Spruce found three or four specimens, widely apart from each other, in the woods of the Rio Uaupés. They differ from each other in the length, both absolute and relative, of the capsule and calyx, and unfortunately I cannot find a single corolla amongst them to examine. The stigmate, as it remains after the fall of the corolla, is in these, as well as in a specimen from Miquel of his *V. parviflora*, very shortly bilamellate at the end of a style of some length. The genus appears to be very distinct from *Voyria*, but very nearly allied to *Schuebleria*.

Voyria, *Aubl.*

This genus affords one of many instances of the danger of gene-

ralizing physiological phenomena, and causes and effects, from the observation of a few isolated facts. From the fact that the well-known European parasites, such as *Orobanche*, *Monotropa*, *Cytinus*, etc., are deprived of leaves or other green parts, it has been laid down as a law that this is the necessary consequence of parasitism on roots of living plants. But already the discovery that *Thesium*, *Rhinanthus*, and others with perfect green leaves, were nevertheless parasites, had destroyed one part of the theory, and now we have the concurrent testimony of several careful collectors, whose attention has been specially directed to the question, that *Voyrias*, which, under the above rule, had been set down as parasites, are not so in fact, but are always to be found on rotten wood or sticks, or amongst dead leaves, in a state of decomposition.

The species now known are numerous, even after we exclude a *Burmanniacea*, which may here and there have insinuated itself among those described in consequence of its similarity of habit. They have been well distributed into sections by Grisebach and others, although here and there the characters may require some correction. The anthers, for instance, in *Leiphaimos* are very often connate, and the filaments of *Leianthostemon*, are usually, if not always, very short; and it is difficult to agree with Miquel in the propriety of raising these sections into the rank of genera, thus breaking up the most natural group we have among *Gentianeæ*.

The *Voyriæ* gathered by Mr. Spruce are all uniflorous. I find among them but two which appear to be already published. One, the common *V. uniflora*, Lam., was found by him at Caripi, near Pará, on bare shady places in the forest, in August, 1849, and again in the woods on the Rio Uaupés, in January, 1853. In the latter place he gathered also a couple of specimens of a pale sulphur-colour, which he thought might be distinct, but I can find no character to separate them. The other appears to be the *V. flavescens*, Griseb., remarkable for the obtuse lobes of the corolla, and for the two rather large ovate scales (or glands?) attached to the ovary, not quite at the base, as described by Grisebach, but about a quarter up its sides. My specimens differ also slightly from Grisebach's character in the tube of the corolla, shorter in proportion to the lobes, and in the anthers, which are connate, with the cells obtuse above, and produced into a rather blunt point below. Yet they belong probably to the same species. Mr.

Spruce found it common in the inundated woods of the rivers Uaupés and Negro, in February and March, 1853.

The three following species are, I believe, new :—

1. Voyria (Leiphaimos) *chionea;* caule filiformi simplici unifloro v. subramoso paucifloro, calyce breviter 5-fido laciniis acutis, corollæ niveæ hypocraterimorphæ tubo gracili laciniis oblongis acutiusculis vix duplo longiore.—Species multo gracilior quam *V. uniflora. Genitalia* fere hujus speciei, sed corollæ tubus dimidio brevior, laciniæ paullo majores et minus acutatæ, et color niveus.

Gathered by Mr. Spruce in forests on the Rio Negro, near Barra, in January, 1851, and distributed as *V. nivea,* Spruce, a name now preoccupied by a species of Miquel's from Guiana. The *V. chionea* was again gathered by Mr. Spruce in the woods of the Rio Negro, above San Joaquim, in March, 1853.

2. Voyria (Leiphaimos) *angustiloba,* Spruce ; caule simplici tenello unifloro, calycis 5-fidi lobis acutiusculis, corollæ flavæ hypocraterimorphæ lobis 5 lineari-subulatis recurvis, filamentis versus apicem tubi brevibus, antheris subconnatis brevibus latis.—*Habitus* squamæ et corollæ tubus *V. uniforæ,* sed laciniis angustissimis 3–5 lin. longis insignis. *Antheræ* latiores quam longæ, basi in filamentum fere cuneatæ. *Stigma* peltato-capitatum. *Flores* pallide flavi.

In shady woods on the Rio Uaupés, February, 1853 (R. Spruce).

3. Voyria (Leianthostemon) *Spruceanum;* caulibus tenellis simplicibus unifloris, calycis 4-fidi lobis lanceolato-setaceis, corollæ hypocraterimorphæ lobis 4 acuminatis, filamentis brevissimis, antheris connatis basi longe bisetosis.—*Rhizoma* filiforme, ramosissimum. *Caules* erecti, 3–5-pollicares, tenues, in sicco aurantiaci. *Squamæ* 2 lin. longæ, subulato-acuminatæ, ad medium connatæ. *Calyx* 4 lin. longus, flavoroseus, fere ad medium 4-fidus, lobis erectis subulato-acuminatis. *Corolla* (ex Spruce) aurea, tubo tenui 6–7 lin. longo, sub fauce leviter ampliato, laciniæ 4–6 lin. longæ, lanceolatæ, acutissimæ, supra basin nonnunquam minute papillosæ. *Antheræ* oblongæ, loculis inter se discretis sed cum anthera contigua connatis, apice obtusis, basi in setas hispidulas corollæ tubo paullo breviores abeuntibus. *Stylus* filiformis, stigmate peltato-capitato.

On rotten sticks in bare places in the forest near Barra, on the Rio Negro, December, 1850 ; in inundated woods on the Rio Uaupés, January, 1853, and on the shores of the Rio Negro, above San Joa-

quim, March, 1853 (R. Spruce); also two specimens mixed with those of *V. uniflora*, gathered by Sir Robert Schomburgk in the Serra Parimé.

In Splitgerber's figure of *V. corymbosa*, the type of the section *Leianthostemon*, the setæ of the stamens are made to look like filaments.

Coutoubea, *Aubl.*

There has arisen a great confusion in the nomenclature of the two common species of this genus, to which I have unfortunately not a little contributed myself, having as well as others been led into error by Aublet's ill-drawn figures, without checking them by his descriptions. His *C. spicata* is evidently the same as Martius' *C. densiflora*, and his *C. ramosa* is the one I have generally taken for *C. spicata;* whilst the plant I have distributed as *C. ramosa* belongs to a very different genus, *Lisianthus.* The true *Coutoubeas* are annuals, although the dry hard lower portion of the stem gives a woody look to many specimens in herbaria. The following are the localities from whence there are specimens in the Hookerian and Kew Herbaria:—

1. Coutoubea *spicata*, Aubl.; foliis basi cordato-amplexicaulibus, floribus sessilibus summis v. omnibus dense spicatis.—*C. densiflora*, Mart.; Trinidad (Lockhart, de Schach, Bromfield); Panama (Cuming, n. 1104, Barclay, Seemann); Santa Martha (Purdie); Surinam (Hostmann, n. 645); Pernambuco (Gardner, n. 1066); Bahia (Salzmann); Caripi (Spruce, n. 230).
2. Coutoubea *reflexa* (Benth.); foliis basi angustatis, floribus sessilibus omnibus dissitis.—British Guiana (Robt. Schomburgk, 1st coll.; a single specimen also, Rich. Schomburgk, n. 1060).
3. Coutoubea *ramosa* (Aubl.); foliis basi angustatis, floribus dissitis plerisque v. omnibus pedicellatis.—Var. *α. racemosa*, racemo elongato subnudo floribus majoribus; *C. racemosa*, Mey. British Guiana (Robert Schom. 1st coll. n. 152; 2nd coll. n. 324; Rich. Schom. n. 397); Santarem (Spruce, distributed as *C. spicata*).—Var. *β. vulgaris*, racemo basi foliato, floribus minoribus; British Guiana (Robt. Schomb. 2nd coll. n. 30); Cayenne (Martin); Surinam (Hostmann, n. 370); Tanaii, near Pará (Spruce); Piauhy (Gardner, n. 2672; also Martius, Herb. Bras. n. 1051 (Gardner's and Spruce's specimens are some of them intermediate between α and β).—Var. *γ. longifolia*, racemis abbreviatis, foliis anguste lanceolato-linearibus acuminatis flores superantibus. A very distinct variety, gathered by Mr. Spruce

in inundated places at the cataracts of Panuré, on the Rio Uaupés, in December, 1852.

The *C. minor* (H. B. K.) is unknown to me, but is supposed to be a dwarf variety of *C. spicata*.

Schultesia, *Mart.*

The only species of this genus, gathered by Mr. Spruce, is the *S. subcrenata*, Griseb. (Linnæa, vol. xxii. p. 34), a curious little plant with yellow flowers, which he found in sands in inundated situations near Santarem, in August, 1850. His specimens correspond precisely with those of the Schomburgks (Rob. Schomb. 2nd coll. n. 481; Rich. Schomb. n. 793).

Lisianthus, *Linn.*, et Irlbachia, *Mart.*

The genus *Irlbachia* was established by Martius for his *I. elegans*, relying chiefly on the glands of the *corolla* and the *echinate pollen*. Grisebach, in adopting the genus, has neglected these characters, but extended it so as to include the *Lisianthus cærulescens*, deriving the character mainly from the narrow linear lobes of the style; but that occurs also in some of the annual *Lisianthi*, as in *L. tenuifolius*, *L. breviflorus*, etc., and passes gradually into the broader lobes of *L. uliginosus* and others. The *calyx valvaris* also, prefixed to the character of *Irlbachia*, must be a mistake; the lobes are certainly imbricate in *L. cærulescens*, and are also represented so in Martius' excellent figure of *L. elegans*. Some of the new species discovered by Spruce tend still further to do away with all distinction between the two genera. *Lisianthus* therefore, to which Grisebach has himself correctly reunited *Leiothamnus* and *Symbolanthus*, becomes a numerous South American genus, with species very different indeed from each other in the size and colour of the flowers, but connected together by a series of intermediates, and united by good common characters.

Mr. Spruce's collections contain four undescribed species, with short, almost campanulate white flowers, which must be very nearly allied to the *Irlbachia Bonplandiana* of Fenzl, but with still shorter corollas and a bilamellate stigma*. These I propose to unite in a distinct section of *Lisianthus*, with the following characters:—

* Some error, possibly typographical, must have crept into Fenzl's description: "stylo bicruri, stigmate simplicissimo acuto terminatum," an expression not very intelligible, independently of the grammatical fault.

Sect. BRACHYCODON.—Species annuæ. Corollæ albæ, subcampanulatæ, tubo calycem vix excedente.

1. Lisianthus *pumilus;* caule humili tenui ramoso, foliis linearibus, cymis bifidis paucifloris ebracteatis, corollæ tubo lato calycem obtusiusculum subæquante.—*Herba* erecta, 2–3-pollicaris, caule angulato fere alato. *Folio* 1½–3 poll. longa, raro lineam lata, acuta, basi longe angustata. *Cymæ* graciles, 3–8-floræ, foliis sæpe breviores. *Pedicelli* tenues. *Flores* parvi. *Sepala* lineam longa. *Corolla* vix duplo longior, alba. *Filamenta* inæqualia, basi dilatata. *Antheræ* breves, demum recurvæ, vix apiculatæ. *Stylus* brevis, lamellis ovali-oblongis erectiusculis. *Capsula* ovoidea, 3 lin. longa.

In inundated woods of the Rio Negro, near San Carlos. R. Spruce, April, 1853.

2. Lisianthus *subcordatus;* caule humili, foliis petiolatis late ovatis subcordatis membranaceis, cymis bifidis ebracteatis, pedicellis erecto-patentibus, corollæ tubo lato calycem obtusiusculum æquante.—*Herba* 3–4-pollicaris, erecta, in specimine simplex, caule tetragono. *Folia* 1½–2 poll. longa, pollicem lata, tenuiter membranacea, quintuplinervia, basi lata, interdum late cordata, petiolo 4–6 lin. longo. *Cyma* breviter pedunculata, bifida, ramis flexuosis sesquipollicaribus. *Pedicelli* breves, apice incrassati. *Flores* parvi, albi. *Sepala* 1 lin., corolla 2 lin. longa. *Filamenta* exserta, infra medium dilatata. *Antheræ* breves, recurvæ. *Stylus* brevis, lamellis oblongis. *Capsula* fere 4 lin. longa, acuminata, omnino similis ei *Irlbachiæ elegantis*, Mart.

Mr. Spruce found but two specimens, one in flower, the other in fruit, near Panuré, on the Rio Uaupés, with the *L. recurvus*.

3. Lisianthus *ramosissimus;* caule diffuso ramosissimo, foliis petiolatis lanceolatis, cymis simplicibus bifidisve bracteatis, corollæ tubo lato calycem obtusum subæquante limbi laciniis eo brevioribus.—*Coutoubea ramosa*, Benth. in Hook. Journ. Bot. vol. ii. p. 45, et in Spruce, Pl. exsic. non Aubl.—*Herba* semipedalis, ramis divaricato-diffusis tetragonis vel 4-alatis. *Folia* 1–1½-pollicaria, obtusiuscula v. rarius acuta, basi in petiolum angustata, membranacea, subtriplinervia, summa decrescentia, floralia bracteantia parva. *Cymæ* breves, semel bifidæ v. simplices, paucifloræ. *Flores* pedicellati, nutantes, albi, vix 2 lin. longi, limbo lato patente. *Calycis* segmenta linea paullo longiora, ovali-oblonga, obtusa. *Stamina* intra faucem corollæ inserta et ei subæqualia. *Filamenta* basi dilatata. *Antheræ* apiculatæ, re-

curvæ. *Stylus* brevis, stigmatis lamellis oblongis. *Capsula* ovato-oblonga, bisulca, 3–3½ lin. longa, bilocularis, placenta demum fere libera 4-partibili.

Gathered first by Sir Robert Schomburgk on the sands of the Rio Negro (1st coll. n. 989), and afterwards by the side of streams, near Barra, on the same river, by Mr. Spruce, and distributed by me as *Coutoubea ramosa*, from which, however, it widely differs.

4. Lisianthus *recurvus;* caule erecto simplici, foliis breviter petiolatis ovatis oblongisve basi acutis crassiusculis, cyma bifida v. dichotoma nuda, pedicellis recurvis, corollæ eglandulosæ albæ tubo lato calycem obtusiusculum vix superante.—*Herba* semipedalis v. rarius fere pedalis, caule angulato. *Folia* 1–1½ poll. longa, ½–1 poll. lata, pleraque obtusa, crassiuscule membranacea, penninervia v. obscure triplinervia, petiolo 1–2 lin. longo. *Cymæ* rami rigidi, ebracteati, leviter flexuosi. *Pedicelli* crassi, valde recurvi. *Calyx* fere 2 lin., corolla 4–5 lin. longa, alba, limbo patente. *Filamenta* exserta, antheris breviter oblongis recurvis apiculatis. *Stylus* brevis, lamellis fere linearibus vix dilatatis. *Capsula* oblonga, arcte reflexa, demum 5 lin. longa.

Near Panuré, on the Rio Uaupés (R. Spruce). This agrees in so many respects with Fenzl's detailed description of the *Irlbachia Bonplandiana* (*Claytonia nemorosa*, herb. Willd.), that I should have considered it to be that plant, but that the corolla is said to be half an inch long, with stipitate glands, of which there is no trace in Spruce's plant. The leaves of the latter are also generally obtuse, and there is nothing in the style to explain Fenzl's expression, which I have already alluded to. I should therefore conclude that Bonpland's plant is a fifth species of the section *Brachycodon*.

The remaining *Lisianthi* from the North Brazilian and Guiana collections in the Kew Herbaria, are chiefly referable to Grisebach's section *Melonanthus*, and may be classed as follows:—

§ 1. *Species annuæ, corollis cæruleis, tubo calyce multo longiore basi attenuato.*

1. Lisianthus *cærulescens*, Aubl.—*Irlbachia cærulescens*, Griseb.—Moist savannahs, British Guiana (Rob. Schomb. 1st coll. n. 164).—Cayenne (Martin).

2. Lisianthus *campanuloides*, Spruce; annuus, caule erecto stricto tetragono subalato basi subramoso, foliis subsessilibus linearibus cras-

siusculis uninerviis margine revolutis, cyma nuda pauciflora, calycis 5-partiti segmentis acutis, corollæ cæruleæ infundibularis tubo gracili, fauce elongata, laciniis ovatis acutis, stigmatis lamellis obovatis. —*Herba* pedalis v. paullo altior. *Folia* iis *L. tenuifolii* simillima, intermedia circa pollicem longa, 1–1½ lin. lata, uninervia, superiora parva remota. *Cyma* remote 3–5-flora; pedicelli leviter recurvi, superiores 3–4 lin. longi, inferiores interdum ultrapollicares. *Flores* cernui. *Calyx* 2 lin. longus. *Corolla* forma fere *L. cærulescentis*, sed duplo major (15 lin. longa). *Stamina* valde inæqualia, inclusa. *Antheræ* recurvæ, apiculatæ. *Capsula* ovoidea, calyce longior, maturam tamen non vidi.

Mr. Spruce found this species abundantly on the right bank of the Rio Negro, opposite Uananaca, in December, 1851, looking at a short distance like a bright blue *Campanula*. The dried specimens resemble so much Martius' figure of his *L. angustifolius*, or *L. tenuifolius*, Spreng., that one would have been tempted to identify them with that species, were it not for the colour of the flower, the shape of the stigmate, and the widely different station.

3. Lisianthus *Spruceanus*, Benth.; annuus, caule erecto subsimplici, foliis petiolatis v. summis subsessilibus oblongis v. lato-lanceolatis membranaceis quintuplinerviis, cyma elongata dichotoma nuda pauciflora, pedicellis recurvis, corollæ cæruleæ tubo in faucem campanulatam ampliato calycem obtusum longe superante, laciniis obtusis, stigmatis lamellis linearibus.—*Herba* 1–1½-pedalis, varietatibus minoribus *L. uliginosi* affinis. *Folia* multo longiora, intermedia 2–3-pollicaria, in petiolum longius angustata. *Cymæ* rami valde elongati, remote pauciflori. *Corolla* circa 9 lin. longa. *Capsula* angusta. In grassy inundated places near San Gabriel, Rio Negro (Spruce).

4. Lisianthus *breviflorus*, Benth.—Serra Mey, British Guiana (Rob. Schomb.)

5. Lisianthus *uliginosus*, Griseb.—Var. *floribus amplis cæruleis*, Demerara (Parker); moist savannahs of the Essequebo (Schomburgk, 1st coll. n. 265); Surinam (Hostmann, n. 29); steep cliffs by the Amazon at Obidos (Spruce).—Var. *floribus amplis albis*. Along forest tracks near Barra, on the Rio Negro (Spruce, distributed as *L. albus*, sp. n.). —Var. *floribus minoribus cæruleis, foliis minoribus basi latioribus*.—*L. amœnus*, Miq. British Guiana (Rob. Schomburgk, 2nd coll. n. 46); Cayenne (Martin); Surinam (Hostmann, n. 29).

The *L. gracilis*, Griseb., from Trinidad, appears scarcely distinct from the last variety, unless the lobes of the stigmate be really narrower at the same stage of growth.

§ 2. *Herbæ perennes, floribus flavo-virescentibus, fauce ampla.*

1. Lisianthus *chelonioides*, Linn., from which the *L. Schomburgkii*, Griseb., does not appear distinct, as the simple inflorescence is evidently accidental on the specimen described, and does not exist on others of the same collection. Abandoned fields, British Guiana (Schomburgk, 1st coll. n. 298); margins of the forest near Santarem on the Amazon (Spruce); Maranham (Gardner, n. 6064).

2. Lisianthus *fistulosus*, Poir., scarcely distinct from *L. acutangulus*, Ruiz et Pav., to which Hooker is correct in referring also the *L. tetragonus* and *L. auriculatus* of my Plantæ Hartwegianæ, and should perhaps likewise include the *L. alatus*, Aubl. Cayenne (Martin); Surinam (Hostmann, n. 387); on the Una road, near Pará (Spruce).

3. Lisianthus *viridiflorus*, Mart.—In capoeiras at Panuré, on the Rio Uaupés (Spruce). The leaves are rather more distinctly petiolate, and rather thinner and more distinctly veined, than in Gardner's Goyaz specimens (n. 3341 and 4278), and in Claussen's from Minas Geraes, but they appear all to belong to one species.

I have also a very distinct annual species with pink flowers, gathered by Sir R. Schomburgk, at Marawaica, on the borders of Guiana, but the single specimen is insufficient for accurate description. I have no specimen of the *L. Elisabethæ*, of the section *Leiothamnus*, described and figured by Schomburgk, in the Berlin Horticultural Transactions.

Tachia, *Aubl.*

Fine specimens of the *T. Guianensis*, beautifully figured by Martius, and corresponding in the venation of the leaves both with that and with Aublet's figure, were gathered by Mr. Spruce in the capoeiras near San Gabriel. Those however which the Schomburgks gathered in British Guiana, belong to two different species, both distinguished from *T. Guianensis* in the venation of the leaves, and from each other in the calyx. They may be thus characterized :—

1. Tachia *Guianensis*, Aubl.; foliis penninerviis, calycibus exalatis breviter dentatis.—In Guiana Gallica (Aublet), et Brasiliæ prov. Rio Negro (Martius, Spruce).

2. Tachia *gracilis;* foliis quintuplinerviis, calycibus exalatis breviter

dentatis.—In the Serra Mey, British Guiana (Rob. Schomburgk, a single specimen.)

3. Tachia *Schomburgkiana;* foliis quintuplinerviis, calyce 5-alato, laciniis lanceolatis tubo longioribus (demum fere pollicaribus).—On the mountains covered with thick forest between Roraima and the Cuyuni, at an elevation of 3000 to 4000 feet (Rob. Schomburgk, a single specimen. Rich. Schomburgk, n. 1546).

The three species closely resemble each other in general habit, in the shape of the leaves, and in the size of the yellow flowers.

DECADES OF FUNGI; *by the* REV. M. J. BERKELEY, M.A., F.L.S.

Decades XLVII., XLVIII.

Indian Fungi.

(*Continued from p.* 174.)

461. *Cyathus Hookeri*, n. s.; peridio cyathiformi pallido intus striato vel omnino lævi; sporangiis amplis; integumento tenuissimo, cortice nigro, sporis minutis.

HAB. On dead wood, Khasia. On moss and lichen covered with sawdust, Kollong rock, Khasia Hills, 1850. (Dr. Hooker.)

Crowded, pale wood-coloured. Peridia cyathiform, sessile or obsoletely stipitate, clothed with squarrose acute scales, obscurely striate within or quite smooth. Sporangia 1 line broad, wrinkled. Integument very thin; bark nearly black; hymenium thick. Spores obovate, $\frac{1}{3800}$ of an inch long.

The spores of this are smaller than in any species except *C. microsporus.* It is certainly very distinct.

462. *C. Emodensis*, n. s.; albidus, campaniformis, basi angustata, subsessilis, superne late apertus, striis plane destitutus, extus fasciculato-tomentosus, margine stellato-ciliato; sporangiis umbrinis lævibus.

HAB. On dead wood, Sikkim. Lachen, 12–13,000 feet. (Dr. Hooker.)

Dirty white. Peridium rather thick, clothed with spongy down collected in little fascicles, quite smooth within; margin fimbriated with the projecting hairs, about 4 lines high, and scarcely so much wide.

Sporangia small, about $\frac{1}{2}$ a line broad, very abundant, nearly smooth, umber-brown, outer coat often peeling off. Spores obovate, sometimes rather pointed below, $\frac{1}{3500}$ of an inch long.

Distinct from *C. vernicosus* in colour, the more tomentose peridium, umber-brown, smaller sporangia, and smaller spores, those in *C. vernicosus* being $\frac{1}{3000}$ of an inch long.

463. *Aschersonia oxystoma*, n. s.; stromate basi floccoso-expanso leviter cylindrico ceraceo armeniaco, centro depresso; sporis oblongis utrinque appendiculatis.

HAB. On the under side of green leaves of some *Myrsinea.* Lower part of India. (Hooker and Thomson.)

Stroma 1 line across, waxy, apricot-coloured, expanded and floccose at the base, above cylindrical, with one or more depressions at the apex; cells irregular, few, large. Spores $\frac{1}{1666}$ of an inch long, oblong or elliptic, with a filiform appendage at either end.

Resembling in colour *A. Taitensis*, Mont., but very different in form and in the spores. There is a closely allied species in Ceylon.

464. *Uredo Clematidis*, n. s.; maculis obsoletis; soris sparsis irregularibus epidermide persistente vestitis; sporis magnis granulato-rugosis pallidis.

HAB. On the under side of the leaves of species of *Clematis nutans.* Paras Nath. (Dr. Hooker.)

Spots obsolete. Sori scattered over the under surface of the leaves, irregular, covered for a long time with the cuticle. Spores minutely rough with raised granules, yellow, becoming pale, $\frac{1}{1500}$ of an inch long, subglobose, rather irregular.

This species seems constantly mixed with a *Puccinia*, which sometimes occupies almost the whole sorus.

* *Coleosporium pingue*, Lév.

HAB. On the leaves and petioles of a species of *Astilbe.* Surureen, June 26, 1850. (Dr. Hooker.)

465. *Ravenelia Indica*, Berk.; soris maximis epidermide laciniata cinctis; sporis pedicellatis, pedunculis longis gracilibus, vesiculis distinctis. Berk. in Gard. Chron. 1853, p. 132, cum icone.

HAB. On pods of *Acacia.* Abundant in the Dunway Pass, Behar. On pods and stems of *Abrus.* Paras Nath. (Dr. Hooker.)

Sori $\frac{1}{3}$ of an inch or more across, surrounded by the laciniated cuticle; the mycelium penetrating the substance of the pods, and producing

a crop of spores on the opposite side. Spores $\frac{1}{750}$–$\frac{1}{250}$ of an inch across; vesicular appendages large, distinct, elongated; peduncle long, hyaline, flexuous.

This is distinguished from *R. glandulosa*, which occurs on several species of *Tephrosia*, in South Carolina, by the long slender peduncles and the distinct vesicles. It is most gratifying to have this confirmation of a very beautiful genus.

* *Ustilago Carbo*, Tul.

Hab. On *Cymbopogon*, Khasia. (Hooker and Thomson.)

Spores $\frac{1}{3500}$ of an inch in diameter, resembling those of the form from New Zealand, figured by Tulasne. There is, however, the ordinary form on Barley from the Soane River, and also one extremely like *Tilletia Sorghi*, Tul., on *Saccharum*, from the same locality, both of which I regard as simple forms of the common Smut.

466. *U. bursa*, n. s.; sporis ellipticis crassiusculis fuligineo-atris minute verrucoso-echinatis.

Hab. On the ovaries of *Anthistiria arundinacea*, Sikkim. (Dr. Hooker.)

Forming a greenish bag about 2 lines long, greatly bulging externally, and tipped with the hard shining horny remains of the integuments and style, frequently with a strong lateral fissure. Spores elliptic, $\frac{1}{2250}$ of an inch long, rather thick, olive-black.

Differing from *U. Maydis* in its elliptic spores. The habit is just that of the common Bunt, but I can detect no unpleasant smell.

467. *U. vittata*, Berk.; germinis basin vittato-elongati occupans; sporis majoribus lævibus globosis.—Berk. in Gard. Chron. 1853, p. 148, cum icone.

Hab. On the germens of some Oplismenoid grass, near the summit of Paras Nath, 4000 feet. (Dr. Hooker.)

Occupying the base of the germen, which is elongated above into a long strap-shaped lamina, which is tipped occasionally with the withered remains of the stigma. Spores subglobose, at first hyaline and often pedunculate, $\frac{1}{1500}$ of an inch in diameter, even, at length brown.

A very singular species, having at first the appearance of an Ergot. The dark spores are however present at the base of the elongated villous appendage, which seem to arise from the germen. M. Tulasne suggests that it may eventually prove congeneric with *Tilletia Sorghi*, which is scarcely a good *Tilletia*.

* *U. endotricha*, Berk., in Fl. Nov. Zel.

HAB. Infesting the fruit of *Carex baccata* or some allied species. Khasia. (Hooker and Thomson.) Tambur river, East Nepal. Nov. 20. (Dr. Hooker.)

The spores in the Khasia specimens are much smaller than in those of Ceylon and New Zealand, but the species appears to be the same. Spores in Khasia specimens, when subglobose about $\frac{1}{4500}$ of an inch in diameter, when elongated about $\frac{1}{3300}$; in the Ceylon specimens they vary from $\frac{1}{2000}$ to $\frac{1}{3000}$, and the same is the case with those from New Zealand.

* *U. Emodensis*, Berk.

HAB. Sikkim, 6000 feet. Nangki, East Nepal, 10,000 feet. (Dr. Hooker.)

Better specimens of this species show that the curious swollen bodies are really excrescences, immediately arising from the stem, and not from any transformation of the inflorescence. The spores are $\frac{1}{4500}$ of an inch long.

468. *U. ocrearum*, n. s.; ocreas in laminas petaliformes deformans; sporis subovatis irregularibus lilacinis lævibus, floccis nullis immixtis.

HAB. On the ocreæ of *Polygona*. Nangki, East Nepal, 10,000 feet. (Dr. Hooker.)

Changing the ocreæ into purple petaliform spathulate expansions. Spores subovate, irregular, variable, $\frac{1}{3500}$ of an inch long, even, thin, without any flocci.

This very curious production is doubtless allied to *U. Emodensis*, but it does not occur on the same species of *Polygonum*; the habit is different, and the spores on the average are larger, flatter, and more irregular.

* *Uromyces apiculosa*, Lév.

HAB. On *Mulgedium Tataricum*. Nubra valley, Tibet, July 28, 1848. (Dr. Thomson.)

* *Æcidium Thomsoni*, Berk. in Gard. Chron. 1852, p. 627, cum icone.

On the leaves of *Abies Smithiana*. North-western Himalayas, 8000 feet. (Thomson.) Sikkim, 9000. (Hooker and Thomson.)

* *Æ. Tragopogonis*, Pers.

HAB. With *Uromyces apiculosa*.

469. *Puccinia ustalis*, n. s.; hypophylla, maculis pallidis; soris mag-

nis suborbicularibus depressis fuscis margine obscurioribus quasi inustis; sporis elongatis pallido-fuscis, stipite brevi.

HAB. On the underside of the leaves of some species of *Ranunculus pulchellus*. Momay Samdong, 15,500 feet. (Dr. Hooker.)

Hypophyllous. Spots pale on either side of the leaf. Sori large, a line or more broad, scattered without any order, depressed, brown, with the edge deeper. Spores pale brown, elongated, oblong, attenuated above, but ending obtusely, often oblique; peduncle rather short.

A very distinct species, remarkable for the large size of its depressed sori.

470. *P. insidiosa*, n. s.; sporis elongatis clavatis apiculo obtuso præditis; episporio crasso; pedunculis longis hyalinis flexuosis.

HAB. Nestling among the spores of *Uredo Clematidis*. Paras Nath. (Dr. Hooker.)

Spores oblongo-clavate, terminated by a little obtuse papilla; episporium very thick, darker externally, so as to give an appearance of two constituent membranes; peduncles long, hyaline, flexuous.

There is no reason to believe that this *Puccinia* is merely a state of the *Uredo*. Instances occur of two species of *Puccinia* growing in the same sorus.

* *Stilbum lateritium*, Berk.

HAB. Eastern Nepal. On bark. (Dr. Hooker.)

471. *Cladosporium scopæforme*, n. s.; cæspitulis parvis orbicularibus; floccis erectis simplicibus nodosis; sporis clavatis elongatis curvis subhyalinis.

HAB. On the underside of leaves of *Myristica Churra*. Khasia*. (Dr. Hooker.)

Erumpent; spots small, orbicular, sometimes scutellæform, consisting of a tuft of erect, simple flocci, which are more or less waved, and repeatedly though not sharply geniculate above. Spores clavate, elongated, attenuated below, nearly colourless, $\frac{1}{1000}$–$\frac{1}{500}$ of an inch long.

A very pretty and distinct species, with the habit of a minute *Circinotrichum*. If the spores were septate, it would come very near to Corda's genus *Helicocoryne*.

* *C. congestum*, n. s.; cæspitulis parvis orbicularibus, floccis erectis simplicibus, sporis brevioribus clavatis curvis subhyalinis.

HAB. On the under side of the leaves of *Litzæa*. Ceylon. (G. H. K. Thwaites.) Spores not exceeding $\frac{1}{1000}$ of an inch. Thread even, not nodulose. Closely allied, but distinct.

SCLEROGRAPHIUM, n. g.—*Flocci* dense fasciculati, apice liberi. *Sporæ* oblongæ, celluloso-septatæ.—*Fungi filiformes epiphyti, Graphio sporis multiseptatis diversi, Mystrosporio analogi.*

472. Sclerographium *aterrimum*, n. s.

HAB. On the under side of the leaves of some species of *Indigofera*, probably *I. atropurpurea*. India.

Scattered over the under side of the leaves in the form of little jet-black threads, scarcely $\frac{1}{2}$ a line high, which at first sight seem to be part of the matrix. Flocci densely fasciculate, somewhat free at the very base and at the apex. Spores oblong or clavate, very dark, transversely multiseptate, with a few vertical divisions about $\frac{1}{1000}$ of an inch long.

This pretty little fungus differs from *Mystrosporium* in the fasciculate threads, and from *Graphium* in the large compound spores. (TAB. VIII. fig. 4.)

* *Geoglossum viride*, Pers.

HAB. On the ground. Yeumtong, 12,000 feet. Sept. 5, 1849. Lachoong, 3000 feet. (Dr. Hooker.)

Specimens slender. Sporidia oblong, often subclavate or slightly curved, $\frac{1}{1000}$ of an inch long, as in Mougeot and Nestler, no. 994. In the Lachoong specimens, which are very dark, the sporidia are about $\frac{1}{1250}$ of an inch long.

* *G. glabrum*, P.

HAB. On the ground. Yeumtong, 13,000 feet. Sept. 6, 1849. (Dr. Hooker.)

473. *Rhizina zonata*, Berk.; orbicularis, demum irregularis, spadicea, margine obtuso; subtus zonata, spongiosa, arrhiza.

HAB. Amongst pine-leaves. Darjeeling. (Dr. Hooker.)

At first orbicular, but becoming at length lobed and irregular, clothed beneath with a dense spongy coat, consisting of red-brown flocci, without any separate rooting fascicles, distinctly and repeatedly zoned; margin obtuse, sometimes slightly reflected. Hymenium even, dark brown. Paraphyses slender; sporidia subelliptic, abruptly pointed at either end, $\frac{1}{750}$ of an inch long, containing two nuclei, nearly colourless.

A very curious and distinct species, calling to mind *Phlebia reflexa*. There is no trace of distinct rooting fascicles, but in old specimens the under coat often becomes cracked.

474. *Peziza æruginea*, n. s.; cupulis cyathiformibus subregularibus, extus ærugineo-obscuris, intus pallidioribus; mycelio lignum superficialiter tingente; sporidiis subfusiformibus majoribus.

On dead wood. Khasia. (Hooker and Thomson.)

Cups about 1 line across, scattered over the surface of the wood, which is strongly but not deeply tinged with green; nearly regular; dark metallic-green externally. Stem about as high as the cups, attenuated downwards, dark green. Hymenium paler; asci linear; sporidia subfusiform, $\frac{1}{3500}$ of an inch long.

This is closely allied to *P. æruginosa*, but not only are the cups more regular and smaller, and the tint darker, and the wood stained more superficially, but the sporidia are half as long again as those of that species, with a proportional increase of width. The sporidia in *P. æruginosa* are about $\frac{1}{5250}$ of an inch long.

475. *Rhytisma piceum*, n. s.; orbiculare sublobatum opacum piceum centro depressum rugosum; margine lævi.

On living leaves of *Pieris*. Tambur Valley, E. Nepal. (Dr. Hooker.)

Orbicular, 5–6 lines broad, opake, very thin at the extreme edge, where it is more or less lobed, then slightly swollen, depressed and rugose in the centre. In less perfect individuals the patches are broken up, and the natural order disarranged.

Most resembling *R. decolorans*, Schwein. Unfortunately the fruit is not perfect.

* *Phacidium ceuthocarpa*, Fr.

HAB. On large poplar-leaves (*Populus ciliata*). Khabili river. 6000 feet. (Dr. Hooker.)

This is no *Sphæria*, but more properly a *Phacidium*. The specimens are unfortunately old, but they show a distinct naked disc, with oblong, minute, subclavate spores, like those so common in some *Pezizæ*, which I have not seen in the published specimens, in which however there is not a trace of perithecia.

476. *Asterina aspersa*, n. s.; subiculo tenuissimo, margine subradiante; ascis sporidiisque oblongis.

HAB. On the under side of the leaves of some species of *Laurus*. Khasia. (Dr. Hooker.)

Spots having exactly the appearance of being formed by drops of dirty water dashed upon the leaves, distinct, black, extremely thin, somewhat radiating towards the margin. Perithecia punctiform, opening with a minute, round ostiolum. Asci and sporidia oblong.

Most resembling a MS. species from Ceylon, *A. nubecula*, in which the spots are scarcely visible. I have not seen the sporidia bipartite, as in that species, but they doubtless become so at last.

477. *A. cincta*, n. s.; maculis fibrillosis; fibrillis sparsis ramosis repentibus; peritheciis globosis, setis acutis cinctis; ascis oblongis.

HAB. On leaves of *Camellia*. Khasia. (Hooker and Thomson.)

Spots one or two lines broad on either side of the leaf, consisting of distinct, creeping, branched fibres, which resemble some minute *Polysiphonia*. Perithecia globose, surrounded by sharp bristles, about as long as themselves. Asci short, linear-oblong; sporidia delicate, subelliptic, but slightly attenuated, uniseptate, hyaline (at least in the specimens examined), about $\frac{1}{2500}$ of an inch long.

This species in some measure connects the genera *Asterina* and *Meliola*. The asci did not very readily part with their contents, and were possibly not mature.

478. *A. scutellifera*, n. s.; mycelio tenuissimo pelliculoso reticulato; peritheciis scutelliformibus, immixtis aliis punctiformibus.

HAB. On living leaves of *Antidesma*. Chittagong. (Hooker and Thomson.)

Patches irregular, extremely thin, peeling off when wetted, consisting of reticulate fibres, marked with little scutelliform perithecia, in which I have not seen perfect fruit. Scattered over the mycelium are other punctiform perithecia, which contain numerous minute, oblong, curved, hyaline spores, $\frac{1}{6750}$ of an inch long.

Though the scutelliform perithecia are still in a sclerotioid state, I think this production too singular to pass over, on account of the second form of fruit on the same mycelium. The species will not be difficult to recognize on account of its extremely thin patches, forming a mere dark cloud, and the scutelliform fruit with which they are spotted. There seems to be frequently a small ostiolum.

479. *Cordyceps falcata*, n. s.; cæspitosa, basi processibus acutis filiformibus immixta; stipitibus cylindricis subito in capitulum falciforme acuminatum incrassatis.

HAB. On a dead caterpillar. Myrong. (Hooker and Thomson.)

Cæspitose; fertile stems 1¼ inch high, about 1 line thick, two or three together, with a quantity of sterile, filiform, acute, abortive processes at the base, cylindrical, swelling gradually into an oblique, falciform, acuminate head, which is rough with the oblong, free, pointed perithecia. Asci filiform, with an inflated appendage at the tip.

This differs from all known species in the cæspitose falcate heads, which are naked at the base on the convex side. The sporidia are not yet formed, so that I cannot compare them with those of other species. (Tab. VIII. fig. 2.)

480. *C. racemosa*, n. s.; stipite cylindrico nigro, capitulo ovato prolifero.

Hab. On a dead caterpillar. Myrong. (Hooker and Thomson.)

Stem nearly two inches high, soiled below with fragments of earth, above very dark, smooth, swollen at the top into a little ovate head, which is covered with short processes, each tipped with an ovate knob. The fructification is not formed at present in the only specimen, which evidently grows from a different and smaller caterpillar than the last, and the stem is very different, so that it can be no form of that species. The fructification is unfortunately imperfect. But for its place of growth it might easily be passed over as an imperfect *Balanophora*. (Tab. VIII. fig. 3.)

* *Xylaria Hypoxylon* (Ehr.).

Hab. Soane River. (Dr. Hooker.)

(*To be continued.*)

Report of a Journey of Discovery *into the Interior of* Western Australia, *between 8th September*, 1848, *and 3rd February*, 1849; *by* J. S. Roe, Esq., Surveyor-General.

(*Continued from p.* 180.)

Being desirous of searching as soon as possible for the coal which our native had heard existed further to the westward, and in a position so favourable as to admit of its being readily embarked in a boat, I proceeded previously to ascend the Phillips, and to examine the good country we had seen in its several valleys on the 21st. Here we found much good grassy land in the vicinity of the river and of its numerous branches and tributaries, the greater number of which came from Mount Short and the Ravensthorpe Hills, and were mostly fresh, though sometimes brackish. Following that branch which led us most to the westward, at the end of twenty-eight miles it had ceased to be worth following, and we proceeded south-westward over generally a poor country, but intersected by many small hollows and watercourses, con-

taining excellent grass, and more or less water, mostly too brackish for use. The trap formation through which the upper branches of the Phillips had been observed to flow, was now changed to granite, which showed itself extensively in the highest and lowest levels of an open country, without timber, and covered with low heathy vegetation, amongst which was much good feed for cattle.

On the eve of Christmas-day I was enabled to give the party a long-promised rest by reaching a well-grassed little tributary to a stream-bed in brackish pools, which was winding its way south-eastward towards the coast in a bed of granite and trap. Here we brought forward our best, for the enjoyment of Christmas in the bush, and dined off an unexceptionable roast saddle of kangaroo, followed up by a pudding which Buck had manufactured out of soaked biscuit and sugar, and an allowance of brandy out of the small stock which we had carried as medicine. There was reason to believe that our repast was overlooked by a party of natives from the rising ground above, whose suppressed voices reached the acute and practised ears of Bob, but whose presence could be nowhere discovered on our searching and calling out. Numerous traces of emu and kangaroo were about our camp, as well as of horned cattle; but the latter were not recent. Of emus we saw but few as we passed through the country, but kangaroos were very numerous on the open downs, and caused me to feel less regret than otherwise at having to mark this day by a considerable reduction in our future rations; a measure rendered necessary by the reduced quantity now remaining on hand, and the uncertain time it would occupy to accomplish the large amount of work still before us. The latitude of our camp was found to be 33° 45′ 41′ S., but the cloudy showery weather greatly interfered with observations of this kind, although otherwise welcome, as affording us a good supply of water among the rocks.

On the 26th our journey south-westward was resumed with renewed spirits and energy, and at noon we felt that another important stage in it was performed by our gaining a misty indistinct view of the Stirling Range, about eighty miles to the W.S.W. We had then reached the system of waters belonging to the river on whose estuary our native supposed we should find surface-coal, and observed increasing indications of its vicinity in red and yellow cliffs, and in the sandstone being in connection with granite,—a watercourse in a deep valley alone separating them. Here we also saw West Mount Barren, about thirty

miles distant, bearing S. 6° 10′ W., and a remarkable double-topped peaked hill to the westward of it, which I called Mount Bland, bearing S. 5° E. Crossing the watercourse last mentioned, in its rapid descent to S.W. by S., we found travelling difficult and rugged, among numerous small rocky ravines, and finally steered to the southward, to avoid them and get upon more level land. At the end of five miles of level sandy country we came upon another branch of the river, winding to the southward in a very tortuous course, in bottom of a rocky steep valley, three-quarters of a mile wide. Here occurred the white, streaked, and coloured sandstones we had previously noticed on the Phillips, in close connection with the coal, accompanied by the same ironstone veins, deep red sandstone, water-worn quartz, pebbles, and rough coarse conglomerates, which had been observed to accompany them. Climbing over the edge of a perpendicular cliff 150 feet high, overlooking the river in the bottom, caverns eight feet deep were found to have been excavated by the atmosphere in the softer white sandstones, and the entire geological formation lay most beautifully developed before us.

The surface, in this dangerous vicinity for our horses, being extremely rugged and thick, I felt glad to remove them away southward as soon as possible, where the land seemed to descend and to become more open, as the distance from the river increased. At the end of two miles and a half we were again upon the verge of a similar sharp bend of the river, winding through a valley a half to three-quarters of a mile wide, and bordered by broken red and white cliffs 50 to 80 feet high, and in many places perpendicular. The whole country hereabouts was extremely rough, and thickly covered with scrub, rendering the greatest caution necessary in threading our way slowly amongst the concealed rocks and holes. Descending to the river's bed by a low hill of granite protruding amongst the sandstones, we came there upon large pools of brackish water, and observed many indications of their being sometimes as high as 25 feet above their then level. Half a mile below this we encamped amongst good grass, in a rich flat formed by the winding of the river, which then seemed to pass amongst numerous flat-topped ridges with narrow summits, sometimes bearing the appearance of perfectly level tables, and in other views assuming the form of sharp red peaks. Our native recognized this river as identical with that on which we were detained on the 25th of October by rainy weather and soft ground, about fifteen miles to the north-westward.

A serious difficulty was now at length forced upon me about our worn-out horses, amongst whom so many shoes were deficient, and so much footsoreness and exhaustion prevailed: they were not easily got on, and I began to fear they would knock up before I could satisfactorily complete the examination of this rough and rugged country. Not a spare nail remained for securing even those shoes which were loose; and the sharp rocks chipped off large pieces of some of the hoofs. To abandon our search for coal at this most interesting period of it was not for a moment to be thought of or endured, and we determined at all hazards to persevere in researches which now appeared so likely to be crowned with success. Choosing the smoothest way that could be found among the sharp rocks, we resumed our descent of the river on the 27th, watered the horses at a pool not quite so salt as those higher up, and in two miles from our camp passed the mouth of the main branch, coming from W. by N., in a valley half a mile wide, with steep cliffy banks. The river itself wound through an intermediate flat of grass and rushes, and was at this time running slowly between large pools; but the presence of samphire seemed to indicate that the water is not at all times fit for use. On the authority of our native, this main branch comes from Jeer-a-mungup, where we had seen so much good country on the 22nd of October last, thirty miles to the W. by N., the whole of which space he also said was well grassed, and fit for good stock-runs. Up to this time we had been in the geological formation previously noticed, of granite on one side of the valley and perpendicular cliffs from fifty to one hundred feet high on the other. Half a mile lower down we passed the mouth of a steep cliffy valley, with a watercourse in it coming from the north; and being then on the high ground, observed the tracks of three horses and a pony, supposed to have belonged to our indefatigable botanist, Mr. James Drummond, who was known to have been recently in this part of the country, prosecuting his favourite pursuit. Avoiding the cliffy bed of the river in this part for two miles and a half, our travelling was improved, and we were then abreast of another steep valley from the north, half a mile wide, and of the same sandstone formation as the others.

Taking again to the river's bed at this part, we were cheered by the sight of shales cropping out on its left bank, and in the bed found a small piece of undoubted surface-coal. Halting the party, further search was immediately made upwards, and all former toils and suffer-

ings were amply rewarded by the discovery of extensive beds of coal occupying the lowest levels in the channel of the river. The part exposed fully to view was twelve to fifteen yards wide, and sixty-one in length, N.N.E. and S.S.W., any further development being concealed by loose drift-sand, covered with thick scrub, which occupied the whole valley, except the immediate channel in use. Mr. Ridley afterwards found amongst this scrub another flat bed of even better-looking coal, eighty yards long and six wide, in contact with the lower end of the above; and there is every reason to conclude that, on clearing away the drift-sand and examining the beds of the deep pools hereabouts, the breadth of coal will be found much more extensive. It seemed to lie horizontally, without perceptible dip or inclination; but the adjoining shales, which cropped out on the river's left bank, showed a dip of 45° to the S.E., and precisely resembled those which had previously been seen on the Phillips.

Diverting the small run of brackish water to a side channel, a pit was dug five feet long and three feet deep, through the mass of coal, without observing any change whatever in its appearance, which was that of carbonized wood, resembling Pine. The grain could be readily traced, and some of the pieces appeared even not to have been completely converted. Having been so long satured with water, it was exceedingly tough and compact, and until dried did not break with a brittle fracture. Elongated globules of bitumen, from the size of a pea to that of a goose-egg, were found in it, as if endeavouring to force their way to the surface. As our mining tools consisted only of a spade and a tomahawk, and I was desirous of moving on while daylight favoured us, we did not penetrate more than three feet, but dried some of the upper and lower pieces and put them through the test of burning. This proved most satisfactory; they burnt with a good flame, and without the slightest crackling or flying, emitted a regular coal smoke and strong odour, and left no residue but a soft white ash. The result was equally satisfactory when we submitted some of it to the process for gas, by means of a tobacco-pipe and some clay.

The river's bed was here two or three hundred yards wide, between very steep banks, and was filled either with rank grass or dense thick scrub. Many marks of floods were visible to the height of at least twenty feet, which will render care necessary in selecting proper sites for shafts to work the coal. On the left bank, and in its numerous

small deep ravines, cropped out the shales, in all that interesting variety we had observed on the Phillips; and their corresponding appearance tended more than ever to confirm the opinion we had formed, that we had been upon a bed of coal in the latter locality, and that it would have appeared in view had not the river been set running by the rains of the previous night.

(To be continued.)

Extract of a Letter from Dr. Harvey, *dated Cape Riche, West Australia, March* 12, 1854.

[We have again the satisfaction of hearing from our eminent Algologist, and we are sure the following extract will interest our readers. —Ed.]

"I am glad you like the *Vanvoorstia*, etc., and that they will be honoured with a figure. It will be long, I fear, before I have anything half so pretty to send from this coast. I came here about ten days ago, to spend a few weeks at Mr. Cheyne's farm, and explore the neighbourhood; and I must needs stay, for want of conveyance, till the beginning of next month, when I return to the Sound, and take the 'May' steamer for Adelaide. At any other season I should find this a good station for land-plants, but now they are mostly out of flower. You will see this place often mentioned in Preiss's book, and for some of his best things. I hope the few seeds enclosed may be worth sowing. I wish particularly that *Symphiomyrtus Lehmanni* (of Preiss. Pl.) may grow; it is a very remarkable shrub, with the foliage of *Eucalyptus*, but very different inflorescence. You must have it from Drummond; it will fill a tub; open air in summer, and mere protection in winter. It grows here on hill-sides near the sea. *Hakea crassifolia* is chiefly remarkable for the size of its wooden fruit, which is as large as a peach, and like it in form, and the shrub looks very funny when stuck over with a hundred such fruits, on its naked lower branches, the upper ones only being leafy. I send a few seeds of *Kennedya nigricans*, on chance of your caring to raise it; it is a rare plant in the colony, though common here on bushes by the sea-shore. *Eucalyptus pleurocarpa* has very glaucous foliage, and is a handsome shrub. *E. Preissiana* is not very handsome, but a very distinct and remarkable species, with top-

shaped fruits. This place is about eighty miles by the road from the Sound, yet this is a three days' journey as travelled. I walked the greater part of the way, though entitled to a seat on a cart, because it gave me the opportunity of picking up the few plants still in flower. The road is through a very barren, and not interesting country, the soil chiefly ironstone (which is good for plants), with here and there sandy or boggy patches. About half-way we cross the Calgan river, now reduced to deep water-holes. *Lambertia inermis* was very common for the latter half of the way, and very beautiful, old and young shrubs alike covered with flowers. Some of the larger specimens were thirty feet high, with very stout stems. I also saw *L. uniflora*, twenty feet high, and very woody. *Beaufortia anisandra* (said to be 'rare' by Preiss) was exceedingly abundant the whole road, and is equally common here. It always reminds me of Sir Francis B., because I remember your telling me that he likes a plant to have a bad smell rather than none at all; and this namesake of his would surely please him, for it has an awful stench. I shall try and get seeds of it, however, for it is well worth introducing, on account of the very remarkable colour (lurid blackish-purple) of the flowers. But I find it no easy matter to secure good seeds of the smaller *Myrtaceæ*. Some of them would be great favourites at home: the purple *Verticordias* and *Calycothrices* are very charming, and so especially is a little *Hypocalymma*, very common at the Sound; but the oddity of all is *Actinodium* (or *Tryphalia*, R. B.), which, to a passing observer, is precisely like a double daisy. It is very abundant in boggy places near Albany. The most striking vegetable productions along the road are, out of all comparison, the *Kingias*, which, when old, and in places not subject to frequent bush-fires, are extremely noble-looking objects, and at the same time grotesque. The old leaves of several years appear to hang on, when not burned off, as is usually the case, and at last are many times the mass of the young leaves, reflexed, and forming a complete cloak to the stem. The young foliage is beautifully silvery, glittering in the sun as it waves to and fro in the wind; the decayed leaves a light tawny, the trunk generally black. Fancy, then, a hill-side clothed with small shrubs, and dotted over with fifty or a hundred *Kingiæ* of all ages. Some of the older ones are branched, which does not improve their appearance. The Grass-trees are far less beautiful, seldom so tall, and with much thicker stems and stiffer leaves. How often I wish I could

transport a living *Kingia* to Kew! I have not yet got seeds of them: they are now in flower; the growth must be very slow. Lindley, in his Swan River Plants, speaks disparagingly of the *Persooniæ*, yet they always please me for the brightness and clearness of their yellow-green foliage, so different from the dull russet of most *Proteaceæ*, and their flowers are often so abundant as to light up the bushes, like a cloud of fire-flies. The *Synapheæ*, too, from the elegant forms of their dry leaves, and the bright yellow of their spiked flowers, are very pleasing. *Dryandræ* are all past flowering. The prostrate species of that genus, and of *Banksia*, several of which were common along the road, have quite the aspect of Ferns, their pinnatifid leaves springing, like those of a *Polypodium*, from underground stems. I have not dug out a *Nuytsia*, but I think it highly probable that there is underground attachment to the roots of other plants. No one, as I am informed, has ever found ripe fruit, and Drummond has looked for it long and closely. The tree increases by underground suckers, which are sent to a great distance. Wherever you see a *Nuytsia*, there are myriads of young stems rising round it. They are leafless, and look like somewhat succulent *Jacksonias*, no true leaves being formed till the plant becomes a tree. It is a very deformed-looking tree at best, but gay enough when in blossom; its leaves, too, are of a very beautiful tender green. They call it the Cabbage-tree.

"My object in coming here at this season was chiefly *Algæ*, but, to my chagrin, I find it a bad coast for them. A good storm would, I believe, afford me many good plants, to judge by the scraps that I find on the beach; but there is very little ground laid bare at low water for examination, and the weather, since my arrival, has been provokingly calm. I must stay three weeks longer, however, so have yet a chance of something. I fear almost all the Australian coast will be similarly circumstanced; that is, that I must depend chiefly on storms for cast-up plants. The *Fucoids* along shore do not seem to reach their proper development; at least, none are yet to be found in fruit, and very few are properly provided with air-vessels. I have got very few of them yet. My dried specimens of *Algæ*, so far, are about 5000, but only about 120 species among them. I have got a *Martensia* (or *Hemitrema*), but very few specimens of it; it was a deep-water waif."

BOTANICAL INFORMATION.

Letter from M. Kralik*, *on his Journey in the Regency of Tunis, addressed to and communicated by* P. B. Webb, Esq.

Gabès, March 10, 1854.

I wrote to you from Tunis†, and now I address you again "prope barbaras Syrtes, ubi Maura semper æstuat unda." I told you I was to make the journey with M. Andrea Mattei, a merchant of Sfax, whose brother Tommaso accompanied M. Pelissier throughout his long peregrinations. Our caravan was insignificant, consisting, besides M. Mattei, myself, and my Negro, of a Jewish merchant and three Sisters of Charity, who were going to establish schools at Souza, and yet an escort was never thought of. We were joined, as we proceeded, by a few other travellers. You may judge, therefore, with how much security the coasts of this Regency can now be visited. The interior would be equally safe, were it not for circumstances which I shall presently allude to. At any rate, I would never advise a naturalist to join a caravan: in a caravan he is no more his own master than in a diligence or on a railroad, unless indeed he is thoroughly versed in the vegetation of the country, and will only stop the party now and then for some object which will compensate for the delay.

The very first day, as soon as we reached the eastern coast, the rains, so continual at Tunis, ceased altogether. We slept near Hamamet, in a large foudouk (caravanserai of the Turks). On the following day we reached Sfax, and remained there an entire day, beneath the hospitable roof of the French Consul.

Our route from Hamamet was most monotonous, running between the sand-hills of the coast and a long lake, which probably M. Pelissier saw only in summer, as he scarcely marks it on his map, though it extends from Hamamet to beyond Herglea. Even now it was beginning to shrink, but the land left dry was perfectly naked. During our halt at Sfax I made two herborizations, and gathered a *Nonnea* in great abundance (*N. pulla ?*), a *Euphorbia*, perhaps nothing more than *Nicæensis*, *Fumaria agraria*, *Fagonia Cretica*, two or three *Linarias*, etc.

Leaving Sfax, we turned aside from the coast, and struck right across

* Now collecting in Tunis, as mentioned at p. 94.
† This letter never came to hand.—*P. B. W.*

the country to Souza, passing by El Djem, where we slept in a miserable Arab hut, and our nuns in another, who were dreadfully alarmed during the night by the entrance of some hag-like Arab women; we were all aroused by their cries, and rushed to their aid. Before daylight we were again on the saddle. I much regretted not having been able to visit the noble ruins of a Roman amphitheatre, which I could only half see in the twilight. The whole of the way from Sfax we found a desert; El Djem is the only village which is found between it and Souza. I could have passed a few days very profitably at Sfax, for the vegetation is five or six weeks earlier there than at Tunis, but I was anxious to reach Gabès. M. Espina however, the French Consul, who has graduated at Paris, and is an amateur of botany, will most obligingly collect for me during my absence.

Arrived on the 25th. I embarked for Gabès on the 28th, in an open boat. The coast is very low, and the sea shallow; decked boats would draw too much water. A rise and fall of the tide of from three to four feet takes place, which is perceptible from Hamamet, as far as the lesser deserts, opposite the isle of Djerba, the ancient Lotophagitis. We reached Gabès on the 29th, at 3 P.M.

Torrential rains had so swelled the waters of the Oued Gabès, that a part of El Mentzel (Menarah of M. Pelissier's map) and of Djarah, including the house of M. Mattei, had been swept away, and we installed ourselves in the house of a Jew, the same in which the Count d'Escayrac was lodged. My first impression of Gabès as a botanical station was not favourable. Between the groups of villages, which taken together form the so-called town, are extensive pastures; behind the village is a grove of Palm-trees, several leagues long, and, as they told me, two leagues wide. Between the trees the ground is highly cultivated, and irrigated by canals from the Oued Gabès, which bounds it on the south. Here of course I found only the common weeds of this part of Africa. On the other side, in the plain, browsed upon by cattle, dominated *Astragalus stella ?* or *cruciatus ?*, *A. Alexandrinus*, *Trigonella maritima*, *Zygophyllum album*, several *Salsolas*, and *Traganum nudatum* everywhere.

A light rain having kept me within-doors, I tried to espy from the terrace some better ground; and perceiving that the Palm-forest terminated on the S.W., and that beyond it, about a league off, were slight undulations, though they appeared bare, I directed my way towards them. I soon saw that I was on the right beat; six times I returned

without reaching the hills, from the plentiful harvest I collected before reaching them. I reached them today (March 17th), but here my flowery land terminated, beyond them was nothing but the wild Libyan desert; but even here I found some old acquaintances from the deserts of Egypt, a *Helianthemum*, *Linaria Ægyptiaca*, *Gymnocarpum decandrum*, etc., and I shall still find several others as the season advances, which I recognized in leaf; altogether our harvest from Gabès will be satisfactory.

It is time now to tell you, that since I have been here, I have learnt that the troops sent to collect tribute in the Djerid (as I passed I saw them encamped under the walls of Souza) had been very ill received by the tribes, who are suffering both from the deficient harvest of last year, and the hurricanes of the winter, which have immensely diminished their crop of dates. In addition to this the two tribes of the Beni Zid and the Hamema are at war; the Beni Zid camp westward of Gabès, the Hamema to the east of the Gofsa, the Capsa of the Romans. The Beni Zid have made a razzia amongst the mapalia of the Hamema: the conflict was bloody; the conquerors themselves lost fifty men, and the Hamema, they say, thrice that number: these latter are now preparing for vengeance. Thus the Djerid and the interior of the Regency are at this moment inaccessible. Caravans have already been plundered; my plans must therefore be changed: first I shall see what there is behind our line of Palm-trees, then I shall try if possible to get to Hamma; if not, I must limit myself in the east to Gabès and the Lotophagitis.

You will like to hear how we fare in these wild regions. Our *carte* is simple enough,—fowls and mutton, mutton and fowls. The Jew is our cook and butler: not that we have wine, but in its place the Lagmi, or milk of Palms. The sap of the tree is obtained by means of a circular wound made by cutting off the crown of the leaves, sparing only the heart; the wound is kept open daily by fresh scarifications. A palm-tree thus treated will yield eight or ten litres of juice in the twenty-four hours, and this during three or four months. This operation does not kill the tree, but it will not bear fruit the year it has been tapped, and in two years it may be tapped again. I have seen trees that had been tapped three times: they are easily distinguished by the narrowing of the stem at the place operated upon, and its smoothness, from the absence of the projecting petioles.

I enclose you a *Silene* for our friend Gay, unknown to me, (annua, foliis linearibus, floribus squalide luteo-fulvis, petalis profunde 2-partitis partitionibus linearibus, corona valde conspicua;) likewise the seeds of a *Composita*, allied to *Cotula subcoronopifolia* (foliis crassis linearibus, floribus eligulatis rufulis, capitulis nutantibus). I found today a single specimen of a Hyacinth, with flowers of the colour of mahogany*, and two of a *Scilla*, quite new to me.

March 19th.—The courrier remains till tomorrow. Today I passed through the Palm-wood; it is narrower than I had been told: I crossed right through it in a good half-hour; beyond it I found again the desert like that to the south of Gabès. The plants in flower, besides *Gymnocarpum decandrum*, were three *Helianthemums*, *Linaria Ægyptiaca*, *Erodium glaucophyllum* and *asplenioides*, an *Astragalus*, *Echiochilon fruticosum*, etc.

This part of the desert is cut into deep ravines by the winter rains; their sides are frequently nearly perpendicular, and will probably give shelter and shade shortly to many curious plants. The rest of the desert is flat, with a slight descent towards the sea, above which its general height can scarcely exceed one hundred and fifty feet. About two leagues further I perceived a chain of low mountains; continuing southward I came upon the chain of lagoons, out of which the Oued Gabès rises. To my surprise I found nothing near them but *Samolus Valerandi;* later in the season they will probably give me something better.

To inspect the whole of my territory I must now make excursions to the north, similar to those I have made to the south.

NOTICES OF BOOKS.

GOODENOVIEÆ, *ad auctoritatem Musei Cæsarei Vindobonensis, Parisiensis, illustr. Roberti Brownei, Guil. J. Hookeri, Joan. Lindleji, Franc-Lessertii, Lud. Preissii, Fred. Lud. Splitgerberi, aliorumque, proposuit* Guil. Henr. de Vriese: *figuris illustravit* Q. M. R. Ver Huell. 4to. 1 vol. Harlem, 1854. 38 plates.

The 'Analecta Goodenoviearum' of Doctor and Professor De Vriese

* *Dipcadi fulvum*, Webb? Phyt. Can.—*P. B. W.*

was given in the 'Nederlandsch Kruidkundig Archief' of De Vriese, Dozy, and Molkenboer; we have in the present work the natural family of *Goodenovieæ* treated in a more expanded form, with full characters of the Order, the genera and species, and, what adds infinitely to the value of the work, excellent figures of thirty-eight principally new or little-known species. Twenty-three genera are adopted, embracing 187 species, viz.:—1. Temminckia, 8 sp. 2. Camphuria, 1 sp. 3. Scævola, 12 sp. 4. Crossotoma, 3 sp. 5. Molkenboeria, 7 sp. 6. Merkusia, 30 sp. 7. Aillya, 1 sp. 8. Dampiera, 41 sp. 9. Linschotenia, 1 sp. 10. Goodenia, 45 sp. 11. Picrophyta, 2 sp. 12. Selliera, 3 sp. 13. Tetraphylax, 1 sp. 14. Stackhovia, 2 sp. 15. Euthales, 3 sp. 16. Velleia, 9 sp. 17. Diaspasis, 1 sp. 18. Distylis, 1 sp. 19. Calogyne, 1 sp. 20. Leschenaultia, 12 sp. 21. Latouria, 1 sp. 22. Antholium, 1 sp. 23. Lemairea, 1 sp.

The last, *Lemairea*, is considered rather a supplementary or doubtful genus, evidently figured and described from very imperfect materials, of a plant in Herb. Delessert, and there bearing the name "*Scævola Ventenatii, Herb. Ventenat.*" If, as represented in the figure, the flower is in the Herbarium apart from the specimen, we are disposed to consider the former as belonging to one plant, and the specimen and fruit to something extremely different, the fruit exhibiting a superior or free berry, subtended by a five-sepaled calyx. The talented and industrious author is, we are happy to learn, engaged in preparing the *Laurineæ* for De Candolle's 'Prodromus.'

HOOKER, W. J. H.: ICONES PLANTARUM; *or, Figures, with brief descriptive characters and remarks, on new or rare plants, selected from the author's Herbarium.* 8vo, 10 vols. 1000 plates.

This work, commenced in 1837, is now brought to a close with the tenth volume, including 1000 plates, the latter entirely executed by Mr. Fitch, and exhibiting many of the more interesting plants in the author's collection. The concluding volume, published by Mr. Pamplin, is entirely devoted to Ferns, and is also offered for sale separately, to such lovers of this beautiful family of plants as do not care to possess the entire work. Of this portion, too, a few copies are prepared on large paper and coloured.

Decades of Fungi; *by the* Rev. M. J. Berkeley, M.A., F.L.S.

Decades XLIX., L.

Indian Fungi.

(*Continued from p.* 212.)

481. *Xylaria piperiformis*, n. s.; clava gracili cylindrica sæpius apice acuminata sterili; stipite elongato flexuoso lineato-rugoso radicante; ostiolis prominentibus; sporidiis minimis.

Hab. Sikkim, 5000 feet. (Dr. Hooker.)

Stem slender, flexuous, $2\frac{1}{2}$–3 inches high, half a line thick, rooting into the soil, marked with linear wrinkles. Head 1–2 inches long, cylindrical, not a line thick, rough with the ostiola and somewhat pruinose, generally acuminate, and barren at the tip. Perithecia elliptic, often scaling off. Sporidia minute, broadly cymbiform, $\frac{1}{4000}$ of an inch long.

Resembling somewhat *X. escharoides*, but far more graceful. The spores are far more minute than is usual in the genus.

482. *X. fistuca*, n. s.; clavula regulari sursum incrassata obtusa, lineis obscurioribus ostiola gerentibus picta; stipite cylindrico abrupto; sporidiis minutis.

Hab. Woods. Myrong. July 7, 1850. Specimens young, and without perfect fruit. East Nepal, 8000 feet.

Whole plant $1\frac{1}{4}$ inch high, fasciculate. Head nearly 1 inch high, subcylindrical, but slightly thickened above, and very obtuse, greyish; outer coat hard, brittle, marked with superficial darker lines, in which the ostiola are seated. Stem cylindrical, abrupt. Sporidia shortly cymbiform, $\frac{1}{3000}$ of an inch long.

A very distinct species from *X. polymorpha*, and resembling more closely *X. corniformis*. The ostiola are quite superficial. The Myrong specimens are immature, but, I believe, identical with those from East Nepal.

* *X. tabacina* (Kickx).

Hab. Kala Panee. June 1850, 5000 feet. (Dr. Hooker.)

Ochreous, dirty yellow-brown; substance white, hard; hollow, with mucous lining.

* *X. compuncta*, Junghuhn, l. c. p. 21.

Hab. Khasia Mountains. (Dr. Hooker.)

The fleshy substance of this curious production, differs greatly from that of most species of *Xylaria*, though there is an approximation to it in *X. tabacina*. The spores are those of the genus, not of *Hypocrea*, and are about $\frac{1}{2500}$ of an inch long. It is very interesting to find this in the same tract of country with *Hypocrea peltata*, another Java species.

483. *Hypocrea semiamplexa*, n. s.; stromate elongato semiamplectente decolorante rubiginoso-pulverulento; ostiolis demum elongatis.

HAB. On the spikes of Bamboo. Darjeeling. (Dr. Hooker.)

Stroma elongated, half embracing the spike, otherwise with the habit of *H. spiculifera*, discoloured, tinged with green when dry, especially within, at length almost black, dusted with a rusty meal. Perithecia subglobose. Ostiola at length elongated.

The specimens are unfortunately young, and do not exhibit fructification, but there can be no doubt of its affinity with or distinction from *H. spiculifera*. There are sometimes a few scattered perithecia on the side not occupied by the thickened stroma. A curious *Hypocrea*, shaped like a little truffle, occurs on the stems of *Arundinaria* in South Carolina.

* *Hypocrea floccosa*, Fr.

HAB. On *Lactarii*. Pomrang. September 18, 1850. (Dr. Hooker.)

* *Hypoxylon vernicosum* (Schwein.).

HAB. Darjeeling. (Dr. Hooker.)

Exactly agreeing with the American species.

* *H. multiforme*, Fr.

HAB. On Birch, Yangma valley. E. Nepal, 11,000 feet, Nov. 28. (Dr. Hooker.)

* *H. perforatum* (Schwein.).

HAB. On Bamboo. Nangki Mountains, 6000 feet. (Dr. Hooker.)

* *H. fragiforme*, P.

HAB. On dead timber, Soane river. (Dr. Hooker.)

A perfectly even form.

484. *H. crenulatum*, n. s.; peritheciis globosis subsolitariis membranaceis, pustulæ liberæ basi expansæ crenulato-limbatæ insitæ.

HAB. On dead stems of Bamboo. Nangki Mountains, 6000 feet. (Dr. Hooker.)

Perithecia large, subglobose, membranaceous, furnished with a papillæform orifice, perforating the truncate centre of a crenulate, free pustule, which is expanded at the base. Asci elongated; sporidia in a

single row, $\frac{1}{1000}$ of an inch long, between cymbiform and fusiform, triseptate, brownish.

Very closely allied to *Sph. sublimbata*, Mont., but the fruit is quite different, and twice as long.

485. *Dothidea vorax*, Berk. et Curt.; spicis deformibus caulibusque innascens, subglobosa vel omnino effusa, nigra, granulata; cellulis minutis; ascis cylindricis obtusis fragilissimis; sporidiis filiformibus.

Hab. On the deformed spikes of some *Carex*. Khasia (Churra). Aug. (Dr. Hooker.) On *Uniola* and *Panicum*, Rev. M. A. Curtis, South Carolina.

Black, subglobose, varying in size from a mere speck to that of a millet-seed, or altogether effused, minutely granulated. Cells minute. Asci cylindrical, obtuse, curved, very fragile. Spores filiform, extremely slender.

Nothing can be at first sight more different than the effused specimens on the stem of *Uniola;* but others on *Uniola* are much larger than the Khasia specimen, insomuch that the species was first named *D. pitulæformis*.

* *Hypopteris apiospora*, (Mont.)

Hab. On bamboo. Nangki mountains, 6000 feet.

* *H. Bambusæ*, (Lév.)

Hab. On dead stems of Bamboo, Nangki mountains, 6000 feet. (Dr. Hooker.)

This species is just intermediate between *Hypoxylon* and *Dothidea*, being the extreme form of *Hypopteris*, to which, if of generic importance, it must be referred. The perithecia appear too highly organized for *Dothidea*. I find the sporidia $\frac{1}{1750}$ of an inch long, dark, fusiformi-elliptic, with a minute appendage sometimes at the base, like that in *H. apiospora*.

* *Sphæria Cayennensis*, Fr.

Hab. On leaves of *Ficus Roxburghii*. Sikkim. (Dr. Hooker.)

Sporidia broadly elliptic, $\frac{1}{2500}$ of an inch long.

486. *Sphæria* (Confertæ) *constellatio*, n. s.; stromatibus monocystis in orbiculum constellatis nitidis.

Hab. On the upper surface of green leaves. Khasia Mountains. (Dr. Hooker.)

Spots scarcely a line broad, orbicular, consisting of from thirty to fifty shining, depressed, sometimes concentrically arranged specks, each containing a single cell.

An extremely pretty little plant, but which will probably, with several neighbouring forms, growing on living leaves in the tropics, be ultimately reduced under one common head, as they differ only in the mode in which the stroma is broken up, and slightly in the admeasurement of the sporidia. I have not found perfect fruit in the present species.

487. *S.* (Obvallatæ) *Nepalensis*, n. s.; pustulis depressis; peritheciis decumbentibus circinantibus; collis longis, ostiolis obsoletis; sporidiis oblongis curvatis.

HAB. On dead twigs of birch. Yangma valley, East Nepal, 9000 feet. November 29. (Dr. Hooker.)

Pustules not a line broad, flattened; disc even. Perithecia circinating, decumbent, seated in the cortical substance, which is heightened in colour so as to be almost orange when seen by transmitted light, within which, in the centre of the pustule, the matrix is pale, approaching to white; necks long; ostiola obsolete. Asci linear; sporidia biseriate, linear-oblong, curved, $\frac{1}{3000}$ of an inch long.

I have very insufficient specimens of this species; but as it is clearly undescribed, and the species of the genus in the surrounding countries are but little known, and, as it should seem, rare, I am unwilling to omit it.

* *Corynelia uberiformis*, Fr.

HAB. On *Podocarpus*. Khasia Mountains. (Dr. Hooker.)

Perfectly agreeing with specimens from the Cape, the species of *Podocarpus* on which it grows being also identical with the Cape species.

* *Meliola*, sp.

Two species occur, the one on *Ilicineæ*, the other on *Myrtaceæ*, at Amure, in Khasia, but neither with perfect fruit.

488. *Polyporus* (Mesopus) *Campbelli*, n. s.; lignicolor, subcarnosus; stipite centrali, cum pileo turbinato undulato confluente; poris minimis brevibus decurrentibus.—Fr. Nov. Symb. p. 32.

HAB. On the ground, into which it penetrates. Poonah. (Assistant Surgeon J. D. Campbell, Esq.)

Wood-coloured, at least when dry. Pileus subcarnose, 3 inches across, plane, but undulated, turbinate, confluent with the stem, which is either short and central, or slightly excentric, irregular, and elongated. Pores decurrent, minute, short; orifice oblique, elongated.

This highly curious species, of which I have merely two sections,

was sent me many years since from Bombay. The specimens have been seen by Fries, and are noticed in the place quoted above. The description is necessarily imperfect, but is sufficient to indicate the species. The habit is that of one of the large Mesopod *Hydna*.

489. *P.* (Pleuropus) *Thwaitesii*, n. s.; candidus; pileo tenui flabellato-reniformi subtiliter tomentoso crebrizonato, margine acuto; poris 4–6-gonis mediis; dissepimentis tenuibus, acie tenuissima sublacerata.

HAB. On dead wood. Ceylon. (G. H. K. Thwaites, Esq.)

Chalky-white. Pileus 1–1½ inch across, flabellato-reniform, thin, very obscurely tomentose, marked with numerous concentric zones; margin acute, slightly incurved when dry. Stem lateral, disciform, not at all elongated. Hymenium slightly ochraceous when dry. Pores $\frac{1}{48}$ of an inch across, four- to six-sided; dissepiments thin. Edge much attenuated, slightly lacerated.

A very beautiful species, allied to *P. Sullivantii*, and remarkable for its large angular pores.

490. *Hexagonia brevis*, n. s.; resupinatus; margine breviter reflexo subtiliter strigoso demum sericeo pallido subzonato; poris latiusculis cinereis.

HAB. On dead wood. Ceylon. (G. H. K. Thwaites, Esq.)

Effused, forming elongated, resupinate patches, with the pale, ochraceous, slightly strigose, at length silky, somewhat zoned border shortly reflected. Hymenium pale cinereous. Pores $\frac{1}{20}$ of an inch across, hexagonal, irregular; dissepiments rigid.

A very distinct species, though possibly the specimens may not be quite perfect. It is perhaps nearest to *P. cervino-plumbeus*, Junghuhn.

491. *Favolus manipularis*, n. s.; fascicularis, tener, tenuis; pileo centrali orbiculari glabro convexo; stipite centrali gracili; poris amplis alveolaribus.

HAB. On dead wood. Ceylon. (G. H. K. Thwaites, Esq.)

Cæspitose, pallid. Pileus orbicular, convex, ½–1 inch or more in diameter, smooth, dimpled when dry, very tender and soft. Stems central, above 1 inch high, not a line thick, smooth, connate below. Pores large, $\frac{1}{20}$ of an inch across, orbicular, hexagonal.

This species approaches *F. cycloporus*, Mont., now referred to *Laschia*. This at least does not seem to belong to that genus, but to be a true *Favolus*.

492. *F. multiplex*, Lév., var. *Thwaitesii;* pileo subintegro flabelli-

formi, disco stipitiformi affixo, lineatim striato postice subtiliter strigoso velutino; poris subhexagonis elongatis; acie setoso-lacerata.

HAB. On dead wood. Ceylon, 1851. (G. H. K. Thwaites, Esq.)

Pileus flabellato-reniform, 3 inches across, scarcely at all lobed, subochraceous, streaked with delicate lines, thin, minutely strigose behind, the pubescence being arranged so as to represent the edges of minute pores. Stem a small disc. Hymenium tinged with brown. Pores very variable in size, elongated, subhexagonal. Edge very thin, minutely toothed.

The specimens are far paler and more entire than those from Churra, but I have no doubt that the species is the same, though at first described by me as distinct.

493. *Didymium Zeylanicum*, n. s.; peridio lenticulari subtus umbilicato cretaceo demum fatiscente subtiliter pulverulento; stipite sursum attenuato elongato sulcato fulvo; capillitio candido; sporis nigris.

HAB. On dead wood. Ceylon. (G. H. K. Thwaites, Esq.)

Stem 1 line high, tawny, incrassated below, attenuated above, sulcate, attached to a shining hypothallus. Peridium lenticular, umbilicate beneath, chalky white, at length cracking, delicately pulverulent. Capillitium white, branched, anastomosing here and there, stained with a fuliginous tinge, very variable in thickness; columella none. Spores globose, $\frac{1}{2500}$ of an inch in diameter.

This species resembles in some respects *Physarum nutans;* but not only is the stem sulcate, but the peridium is decidedly pulverulent, like a leaf covered with *Oidium.* When the powdery coat is rubbed off, it appears rugged, like the surface of an egg.

494. *Æcidium rhytismoideum*, n. s.; maculis latis inustis rhytismoideis; peridii margine lato laciniato; sporis subangulatis.

HAB. On the under sides of leaves of *Diospyros.* Ceylon. (G. H. K. Thwaites, Esq.)

Spots ½ an inch or more broad, resembling exactly those of some *Rhytisma.* Peridia scattered; margin spreading, broadly lobed, consisting of pentangular or hexangular cells, the commissures of which are finely crenate. Spores more or less angular.

A very singular production. The black stroma is apparently covered with papillæform ostiola, but I have not been able to detect any trace of reproductive bodies in them. I do not however assert positively that it is really a part of the *Æcidium.*

495. *Æ. Pavettæ*, n. s.; maculis orbicularibus fuligineis; peridii margine reflexo lobato; sporis subangulatis.

HAB. On the under sides of leaves of *Pavetta*. Ceylon. (G. H. K. Thwaites, Esq.)

Spots $\frac{1}{2}$ an inch or more broad, dingy; peridia scattered, more numerous towards the centre; border reflexed, lobed. Cells not crenate at the edge, as in the last. Spores somewhat angular.

A far more minute species than the last. The spot is merely discoloured, and not incrassated as in that species*.

* *Graphiola Phœnicis*, Poiteau.

HAB. On *Phœnix farinifera*. Ceylon. (G. H. K. Thwaites, Esq.)

496. *Sphæria* (Cæspitosæ) *Broomeiana*, n. s.; peritheciis in cæspitem orbicularem congestis atris opacis setis brevibus exasperatis; ostiolo papillæformi notatis vel omnino astomis; ascis clavatis latis; sporidiis innumeris minutis oblongis curvis.

HAB. On dead wood. Ceylon. (G. H. K. Thwaites, Esq.)

Perithecia black, opake, sprinkled with short, black, stout bristles, crowded into little orbicular tufts, scarce a line broad, either altogether destitute of an ostiolum or with an abrupt central papilla. Asci clavate, broad, stuffed with numerous, oblong, curved, minute, hyaline sporidia.

The minutely setulose perithecia, and abundant sporidia, at once distinguish this species from any with which it might be confounded.

497. *Dothidea repens* (Corda), var. *catervaria;* pustulis minutis in maculas orbiculares l. irregulares catervatis; ostiolo papillæformi; ascis brevibus; sporidiis suborbicularibus hyalinis.

HAB. On the leaves of *Ficus oppositifolia*. Ceylon. (G. H. K. Thwaites, Esq.)

Pustules not $\frac{1}{6}$ of a line broad, crowded into orbicular or irregular spots, which are very conspicuous on the under sides of the leaves. Ostiola minute, papillæform. Asci short, attenuated above. Sporidia nearly orbicular, minute, hyaline.

A form of *Sphæria repens*, Corda, with shorter asci, less shining pustules, and more orbicular sporidia.

* *Æ. echinaceum*, n. s.; maculis pulvinatis orbicularibus oppositis concavis umbrinis; peridiis spinæformibus rigidis nitidis, serius apice laciniatis, sporis globosis.

HAB. On the under surface of leaves of *Actinodaphne molochina*, Nees. Ceylon, 7000 feet. April, 1854. (G. H. K. Thwaites, Esq.)

Spots 1–2 lines across. Peridia rigid, shining. Spores yellowish, $\frac{1}{900}$ of an inch in diameter, nearly globose.

Var. *aspidia;* pustulis latiusculis sparsis piceis; ascis elongatis sursum attenuatis; sporidiis hyalinis subellipticis.

HAB. On leaves of *Ficus repens*, Ceylon. (G. H. K. Thwaites, Esq.)

This has more pretension to be considered as a species than the last; but it seems that on each species of *Ficus* a different form prevails, and it is more convenient to collect them under one species than to make a multitude of species, scarcely differing from each other.

A form occurs also in Ceylon on *Tetranthera tomentosa*, which I should willingly unite. In this the pustules are more minute; the asci much elongated, but still broader below; and the sporidia more oblong. This I have distributed under the name of *Sphæria tetrantheræ.*

498. *Dothidea incarcerata*, n. s.; pustulis minutis piceis; stromate pallide cervino; cellulis paucis irregularibus; ascis oblongis; sporidiis hyalinis subellipticis.

HAB. On the upper sides of the leaves of *Uvaria*, *Guatteria*, and other *Anonaceæ*. Ceylon. (G. H. K. Thwaites, Esq.)

Pustules punctiform, variable in size, but scarcely attaining $\frac{1}{4}$ of a line in diameter, slightly raised, pitch-brown. Stroma pale fawn-coloured. Cells few, irregular, entirely immersed in the stroma. Asci oblong, rather short, pointed or obtuse. Paraphyses linear, about the same length as the asci. Sporidia hyaline, subelliptic, inclining to oblong, sometimes slightly attenuated at either end, varying from $\frac{1}{1250}$ to $\frac{1}{2000}$ of an inch in length, but more commonly $\frac{1}{1500}$.

This species varies a little on different leaves, being sometimes seated on an arid patch, sometimes on the unaltered leaf; sometimes there are one or more distinct ostiola; sometimes the pustules are quite even. All will however be found to agree in essential structure. Specimens have been distributed under the name of *S. Guatteriæ*, from a notion that they were distinct from those on *Uvaria;* but a fresh examination has forced me to unite them.

499. *D. filicina*, Mont. MSS., var. *nervisequia;* peritheciis elongatis subpunctiformibus aggregatis subnervisequiis depressis; ascis brevibus latis; sporidiis clavæformibus centro subconstrictis uniseptatis.

HAB. On the under side of fern-leaves. Ceylon. (G. H. K. Thwaites, Esq.)

Perithecia elongated, subpunctiform, slightly depressed, disposed in simple and forked lines, following more or less the direction of the nerves, so as to form little, pinnate, black patches. Asci short, very

obtuse. Sporidia clavate, uniseptate, constricted in the centre, about $\frac{1}{2000}$ of an inch long. When dry, the sides of the perithecia contract, so as to give the mass a sort of reticulated appearance when examined under the compound microscope.

This curious parasite has a very different appearance from *D. Pteridis*, being far less compact. It is certainly merely a form of the plant of Dr. Montagne from Otaheite, on some species of *Adiantum*, though the perithecial prominences are more minute, and the spores shorter. In Dr. Montagne's plant, in which the fructification is not very perfect, I find a hyaline coat to the sporidia, a circumstance which cannot be regarded as of specific importance. The difference in habit, and the slight decrease of size in the sporidia, probably depend upon the different matrix. The same species also occurs in New Zealand.

499 *a*. *D. exsculpta*, n. s.; stromate orbiculari nigro margine radiatim exsculpto; ostiolis papillæformibus centralibus.

HAB. On the under side of leaves of *Agyneia multilocularis*. Ceylon. (G. H. K. Thwaites, Esq.)

Stroma orbicular, a line or more broad, delicately grooved, with forked and intermediate lines, so as to resemble the hymenium of a *Lenzites* in miniature. Ostiola papillæform, central often numerous.

I have not seen this very curious production with perfect cells, much less with fruit. The habit is however so curious, that it cannot fail to be recognized. The substance is brittle and carbonaceous.

500. *D. Thwaitesii*, n. s.; pustulis nitidis cum matrice continuis; cellulis irregularibus; ascis lineari-clavatis; sporidiis hyalinis oblongo-clavatis.

HAB. On leaves of some *Cyperacea*. Ceylon. (G. H. K. Thwaites, Esq.)

Pustules oblong, subelliptic, pitch-brown, shining, scarcely raised above the surface: Cells irregular. Asci linear or clavate. Sporidia uni-bi-seriate, narrow, oblongo-clavæform.

Resembling somewhat *Sphæria Salzmanni*, Dalz., and very distinct from analogous forms on Grasses and Sedges.

Fungi described in the fifth Century now completed.

Æcidium *echinaceum*, Berk.
,, *Pavettæ*, *ib.*
,, *rhytismoideum*, *ib.*

Agaricus *fulviceps*, *ib.*
,, *Khasiensis*, *ib.*
,, *montosus*, *ib.*

Aschersonia *oxyspora**, *ib.*
Asterina *aspersa*, *ib.*
„ *cincta*, *ib.*
„ *scutellifera*, *ib.*
Boletus *flavipes*, *ib.*
„ *pusillus*, *ib.*
„ *verrucarius*, *ib.*
Cladosporium *congestum*, *ib.*
„ *scopæforme*, *ib.*
Cordyceps *falcata*, *ib.*
„ *racemosa*, *ib.*
Cyathus *Emodensis*, *ib.*
„ *Hookeri*, *ib.*
Cyclomyces *turbinatus*, *ib.*
Dædalea *Emodensis*, *ib.*
Didymium *Zeylanicum*, *ib.*
Dothidea *exsculpta*, *ib.*
„ *filicina*, Mont.
„ *incarcerata*, B.
„ *repens*, Cord.
„ var. *aspidia*, B.
„ var. *catervaria*, *ib.*
„ *Thwaitesii*, *ib.*
„ *vorax*, Berk. et Curt.
Favolus *manipularis*, B.
„ *multiplex*, Lév.
„ var. *Thwaitesii*, B.
„ *setiporus*, *ib.*
Hexagonia *brevis*, *ib.*
Hydnum *vespertilio*, *ib.*
Hypocrea *semiamplexa*, *ib.*
Hypoxylon *crenulatum*, *ib.*
Irpex *zonatus*, *ib.*
Lactarius *stramineus*, *ib.*
Laschia *lamellosa*, *ib.*
Lentinus *inquinans*, *ib.*
„ *Nepalensis*, *ib.*
Lentinus *prærigidus*, *ib.*
Lenzites *eximia*, *ib.*
„ *ochrophylla*, *ib.*
„ *subferruginea*, *ib.*
Lycoperdon *delicatum*, *ib.*
„ *elongatum*, *ib.*
„ *Emodense*, *ib.*
„ *xanthospermum*, *ib.*
Merulius *lignosus*, *ib.*
Peziza *æruginea*, *ib.*
Polyporus *adamantinus*, *ib.*
„ *Beharensis*, *ib.*
„ *Campbelli*, *ib.*
„ *cereus*, *ib.*
„ *corium*, *ib.*
„ *digitalis*, *ib.*
„ *elatinus*, *ib.*
„ *endophæus*, *ib.*
„ *flammans*, *ib.*
„ *flavidus*, *ib.*
„ *florideus*, *ib.*
„ *gratus*, *ib.*
„ *medullaris*, *ib.*
„ *Nepalensis*, *ib.*
„ *nodipes*, *ib.*
„ *pictilis*, *ib.*
„ *pudens*, *ib.*
„ *scopulosus*, *ib.*
„ *semitostus*, *ib.*
„ *squamæformis*, *ib.*
„ *Thomsoni*, *ib.*
„ *Thwaitesii*, *ib.*
„ *vallatus*, *ib.*
„ *versiformis*, *ib.*
„ *vivax*, *ib.*
„ *xaranticus*, *ib.*
Puccinia *insidiosa*, *ib.*

* Not *oxystoma*, as in the text.

Puccinia *ustalis, ib.*
Radulum *spongiosum, ib.*
Ravenelia *Indica, ib.*
Rhizina *zonata, ib.*
Rhytisma *piceum, ib.*
Scleroderma *nitidum, ib.*
Sclerographium *aterrimum, ib.*
Sphæria *Broomeiana, ib.*
„ *constellatio, ib.*
„ *Nepalensis, ib.*
Stereum *Cacao, ib.*
„ *endocrocinum, ib.*
„ *scytale, ib.*
Trametes *cingulata, ib.*
„ *crenulata, ib.*
„ *Hookeri, ib.*
„ *immutata, ib.*
„ *tephroleuca, ib.*
Tremella *protensa, ib.*
Uredo *Clematidis, ib.*
Ustilago *bursa, ib.*
„ *ocrearum, ib.*
„ *vittata, ib.*
Xerotus *lobatus, ib.*
Xylaria *fistuca, ib.*
„ *piperiformis, ib.*

On the Tree supplying the Sabicù Wood *of Cuba; by* George Bentham, Esq.

In re-arranging, some years since, the numerous species of *Mimoseæ*, and in endeavouring to fix within more certain limits the various genera which modern botanists have established, I was much embarrassed by a small group of West Indian and tropical American species, which partook of the characters of several of the larger genera, and yet would not associate strictly with any one of them. At the same time, I had but very incomplete specimens of most of these anomalous species, and it was with considerable hesitation that I proposed to collect them into a distinct genus, under the name of *Lysiloma*. What few specimens I have since received, tend however to confirm its main characters. The stamens are indefinite and monadelphous, as in the *Ingeæ*, but few in number; and the pollen appears generally, if not always, to consist of an indefinite number of separate granules, as in *Eumimoseæ*. The pods are flat and thin, as in *Leucæna*, *Albizzia*, and several *Acaciæ*, but it does not, as in those genera, open in two valves. The border remains entire, as in *Mimosa* and *Entada;* the valves within, closely adhering together round the margins, appear to rot or break away in the centre to allow the escape of the seeds, or in some instances have a tendency to separate into transverse joints, almost as in *Mimosa*.

To this group, if we may rely on the collections of Ramon de la Sagra, belongs the Cuban tree which supplies the Sabicù wood now ex-

tensively imported into this country for its excessive hardness, which renders it so valuable for ship-building and other purposes. It was referred by Achille Richard, in his 'Flora of the Island of Cuba,' to the *Acacia formosa* of Kunth; but that is a species of *Calliandra*, from Mexico, with very numerous stamens, and differing also from the Cuban tree in many points in habit and foliage, as appears on a comparison of the characters given by Kunth and A. Richard respectively, and still more so of the specimens themselves. Those before me of the Sabicù were communicated under that name by Ramon de la Sagra to the elder De Candolle, and are consequently derived from the same source as those described by Richard; and the inspection of an original specimen of Humboldt and Bonpland's, in the Paris Herbarium, has proved to me that I was correct in identifying with this *Acacia formosa* the *Calliandra* of that name I described in the third volume of the 'London Journal of Botany.' The main point in which De la Sagra's specimens of the Sabicù do not quite agree with A. Richard's character, is in the presence of a small gland on the petiole, below the lower pair of pinnæ, which however the latter botanist may easily have overlooked, copying Kunth's expression, "petiolis eglandulosis," without any very close verification.

We may therefore consider the Sabicù as a new species of *Lysiloma*, with the following character:—

Lysiloma *Sabicu;* glabra, stipulis (caducis) oblique ovatis, petiolis tenuibus, glandula parva, pinnis 2–3-jugis, foliolis 4–5-jugis oblique obovalibus v. late oblongis obtusissimis, capitulis globosis, ovario subsessili glabro, legumine longe stipitato.—*Arbor* pulchra. *Stipulæ* fere semipollicares, membranaceæ, venosæ. *Petioli* tenues, communes partialesve 1–2-pollicares. *Glandula* petiolaris parva, scutellata, infra pinnas inferiores, jugales perpaucæ minutæ. *Foliola* subsemipollicaria, penninervia, rigidule membranacea, subtus pallentia. *Pedunculi* axillares, sæpius solitarii, 1–1½-pollicares. *Capitula* globosa. *Bracteæ* inconspicuæ. *Calyces* sessiles, tubulosi, 5-dentati, lineam longi, glabri. *Corolla* tubulosa, 5-fida, calyce duplo longior, lobis apice villosis. *Stamina* 15–20, corolla duplo longiora, filamentis fere ad medium coalitis in tubum basi corollæ breviter adhærentem. *Ovarium* subsessile, glabrum. *Legumen* 4–5 poll. longum, 1–1¼ poll. latum, planum, glabrum, margine incrassato, stipite pollicem longo, valvulis circumcirca arcte connatis, medio solutis, demum circa semina deliquescentibus.

This valuable tree appears, as far as hitherto known, to be strictly confined to the island of Cuba. The same island produces however another Mimoseous tree, of which the timber is in much use not only in Cuba, but in Jamaica and other West Indian islands, where it is also found, as well as on the mainland of Central America. This is the *Pithecolobium filicifolium*, called in Cuba, according to Ramon de la Sagra, *Moruro* and *Tengue*. A. Richard says that its wood is hard and durable, whilst Sloane, who describes and figures the same tree very accurately, tells us that although much felled for timber, it is rather soft. The specimens sent as the Sabicù by Don Pedro Ferrer Landa, agent to the Cobré mines in Cuba, to W. Wilson Saunders, Esq., although in leaf only, appear to belong to this tree, and certainly not to the *Lysiloma*, which, as above mentioned, is, according to Ramon de la Sagra, the true Sabicù. There is therefore still much to clear up by those who may have further opportunities of procuring really authentic specimens.

VEGETABLE FIBRES *of the Bahamas; copy of a Letter from* C. R. NESBITT, ESQ., *addressed to the Editor, dated*

Government House, Nassau, 21st March, 1854.

I am extremely happy to learn that you had taken an interest in the Pine-leaf fibre, having been the first to publish in England any particulars of the manufactory near Breslau; and I also feel gratified to learn that you have taken steps to obtain information relative to some simple machinery, adapted to the preparation of Vegetable Fibre.

If machinery can be obtained for effectually extracting fibre from the vegetable substance which encases it, one of the most important obstacles to its supply on moderate terms will be removed.

There are several valuable descriptions of fibrous plants which flourish in this colony, besides the Pine-fibre, known as '*Pitie plant*,' *Bamboo*, *Aloe*, and *Manilla:* one description was supplied to the colony by the late Vice-Admiral Fleming, when commanding the naval forces on this station; another description was sent comparatively recently, from Florida, by the British Vice-Consul Baldwin. The fibre from these plants is considered closely to resemble Manilla Hemp. Both descriptions are spreading rapidly over the colony; and there are several indigenous kindred fibre-plants, growing in masses at Eleuthera and

other portions of the colony, of a somewhat thicker and tougher nature than those I have described.

There are two processes resorted to at present for extracting the fibre from these plants. One is the submerging the leaves in water for several days, and then separating by hand the softened and decayed vegetable substance from the fibre; this process is somewhat objectionable on sanitary grounds, inasmuch as a very offensive odour proceeds from the water in which the leaves have been long saturated. The other process is by gently beating the leaves with a wooden mallet in their green state, and, by water and manipulation, separating the vegetable substance from the fibre. This latter process is tedious, and consequently expensive, though the fibre remains white; while in the former case it is stained brown by remaining in the impure water, in which decay has occurred. The amount of fibre obtainable, depends on the profit; and I fear the profit will be insufficient, until the cost of labour is reduced by the introduction of machinery.

The description of plants I have mentioned, as being introduced into this colony by Vice-Admiral Fleming and Vice-Consul Baldwin, are extremely well adapted for this climate, as they appear to obtain great nourishment from the air and dew, and seem to thrive equally well in dry as in wet weather. Whereas the Plantain and Banana, though flourishing in the moist rich soils of British Guiana and the Sugar Colonies, are delicate and liable to "die out" in this less humid climate, except with great attention, both as to artificial manure and locality, and seem only to be in a thoroughly thriving state when planted in cane-holes, which in certain localities are abundant though not general.

The plants I have alluded to as belonging to the Bamboo, and to the Manilla tribe, are so hardy, that neglect does not hinder their growth; they force themselves through strong weeds that are fatal to most other plants, and seem to have no insect or other enemy to contend with. This advantage is important; for it was the insect enemies in the Bahamas, known as the 'Bug,' and 'Chenille,' or caterpillar, that formerly destroyed the hopes of the Bahama cotton-planter, and transferred that lucrative cultivation to the Southern States of America.

Since writing the above, I have shown one of the plants above referred to, to a gentleman who has been in New Zealand, and he pronounces it to be exactly similar to the New Zealand Flax plant; the

fibrous texture from which, is there obtained by immersion in running streams of water, and subsequent manipulation.

The botany and natural history of the Bahamas, as you are probably well aware, is principally to be met with in a valuable work with plates, which retain nearly their pristine brilliancy of tint, published in 1771, entitled 'The Natural History of Carolina, Florida, and the Bahama Islands,' by Mark Catesby, F.R.S.; a work deserving to be republished in a portable size.

Catesby describes four kinds of Pine which grow in Carolina, and are there distinguished by the names of 'Pitch Pine,' 'Rich Land Pine,' 'Short-leaved Pine,' and 'Swamp Pine.' He does not describe any of the Pine tribe in the Bahamas, and he was probably unaware of their existence; and as they are limited very much on New Providence to the interior, they were probably inaccessible, for want of roads, when Catesby visited this colony.

You refer to the *timber* of our Pine-tree, as being probably especially valuable; and you refer to the wood of the Southern Pine, of the United States, to which you think it possibly analogous, as being preferred to all other Pines in naval architecture.

I am informed that the wood of our Pine-tree at Abaco resembles the wood of the Southern Pine of the United States, even more than that grown on New Providence. There are very fine schooners, of a beautiful model, and fast sailers, annually built at Abaco, the beams and keels for which vessels are obtained from the Pine-trees grown there. The planking is generally American Yellow Pine: the latter, I have reason to believe, is simply preferred from being more cheaply obtained, it being sawed up in the States by steam machinery, with which mere manual labour cannot compete. I fear, however, that unless the introduction of steam machinery, for the purpose of sawing the Pine-trees of the Bahamas into plank, be introduced, there is little probability of private enterprise undertaking it. If so undertaken, the operations suggested by you for obtaining pitch, tar, and turpentine from the Pine-trees might be accomplished. These products might be obtained in summer from the trees destined to be cut in the autumn, when "the sap is down;" and the trees, by being thus relieved, would probably yield more readily to the saw, and the timber be more durable, than if cut when "the sap is up" in the spring and summer.

Generally the expense of fuel is an important item in connection with

steam machinery; but this in the Pine-forests could readily be supplied from the branches and other portions of the Pine-trees not destined for plank. I have no experience in the expense of such steam machinery; but in the Charleston papers of South Carolina, portable saw-mills, for steam-power, are advertised at the rate of £500 each.

Catesby, at page 23, has a detailed account of the manner of making tar and pitch in the Pine-forests of Carolina.

Within the last ten years a great internal traffic has grown up in charcoal, from the Pine-trees in New Providence. The same wood is used for burning the stone of the country, and reducing it into lime, which is sold at from sixpence to ninepence the bushel.

The wood of the Pine has the reputation of being very durable when unexposed to the weather, and, having been seasoned some time by remaining under cover after being cut up, of being able to bear exposure. What the effect on the durability of this timber would be by relieving it of its resinous matter in the proper season, as is said to be always done in the United States, remains to be tested by experience.

The qualities of the Pine-wood may be much affected by the soil. The greater part of the Pine-forests of the Southern States have, I have been informed, a surface-soil of sand. It is so at Abaco; while on New Providence, Grand Bahama, and Andros Island, the surface is rocky and rugged.

Catesby says, "One would expect (speaking of the Bahama Islands) that they afforded the disagreeable prospect of bare rocks, but on the contrary, they are always covered with a perpetual verdure;" and again, "Though the trees on these rocky islands grow generally not so large as in Virginia and Carolina, where the soil is deep, yet it is amazing to see trees of a very large size grow out of rocks where no soil is visible."

I have thus, I believe, nearly exhausted the subject of Pine-trees; and will merely add that, a bale containing about eighty pounds of Pine-leaf fibre has been forwarded hence to the "Anglo-Franco-Algerian Fibre Company," in London, with a view of its being put through their process, and obtaining a report of its commercial value, as estimated by them.

I have since observed a prospectus mentioned, of a British Colonial Fibre Company, from which I anticipate favourable results to the colonies.

I have sent, agreeably to your request, in a small box, specimens of

three descriptions* of Pines, indigenous to this colony, with cones attached, labelled; also a few other specimens, and some seeds. Among the latter is a parcel of Bahama cotton-seed, and a specimen of the cotton, that its value may, if necessary, be compared. I was induced to do this, from reading Governor J. J. Hill's Report of Cotton on the Gold Coast, published in the 'Blue Book,' laid before Parliament in 1833 by Her Majesty's command, with the annual reports of the governors of the British Colonies for 1852, page 197. The American cotton was originally obtained from seeds of cotton-plants grown in the Bahamas; and possibly the seed might equally be adapted for Africa. Here it is a perennial plant, and I think it most probable it would not be liable to the same objections as the Ashantee, or Long-stapled Cotton, referred to by Mr. Freeman in the document accompanying Governor Hill's report, of not bearing the second year. The cotton-seed now sent is taken from plants that have been in bearing for the last six years. It would be curious if, while the Bahamas have ceased, for any commercial purpose, to produce cotton, they may be hereafter traced as having given this important seed to *two* continents. I have little doubt but that the successful culture of cotton in Africa would do as much to put down the slave-trade there, as it has assisted in supporting slavery in America.

Report of a Journey of Discovery *into the Interior of* Western Australia, *between 8th September*, 1848, *and 3rd February*, 1849; *by* J. S. Roe, Esq., Surveyor-General.

(*Continued from p.* 217.)

Having fully satisfied ourselves as to the *bona fides* of all we had seen, and feasted our eyes on the broad sheet before us, which was calculated to prove of such important benefit to the colony, we took away as much of the coal as could be conveniently carried on our jaded horses, and moved away to where Bob remembered to have drunk fresh water from a well, amongst good feed for the horses. In one mile E. by N. we reached it, and were afforded another proof of the unerring memory and instinctive sagacity of the aboriginal native, in

* The three specimens seem to be mere varieties of one and the same species. The leaves much resemble those of *Pinus australis*: but the cones are like those of *P. tæda*, to which I would refer it.—Ed.

thus being able, in so intricate a part of the country, almost totally unknown to him, to walk direct to a small water-hole, entirely concealed from view amongst tufts of grass. Plunging into the midst of these, our sable friend remained at least two minutes underground, and then re-appeared with a distended stomach, and the welcome intelligence that plenty of good water existed six feet below the surface. Encamping immediately under shelter of some neighbouring bushes, the spade was tried, and soon produced fresh water, two feet below the surface, and therefore accessible to the horses, to whom, and to all of us, a little good fresh water was quite a treat. These wells were in a grassy tributary to the coal-river, the steep white banks of which were visible a quarter of a mile below our camp. In the meantime Messrs. Ridley and Gregory had followed that river downwards a short distance, and reported that, a mile below the coal, the shales were still abundant, but apparently in some disorder, the dip being changed from S.E. to S.W., and occasionally to the south. They saw no more coal, and found that a very white appearance, which covered the entire right bank of the river, below the coal-bed, was caused by very numerous fragments of white quartz, which had apparently fallen from the surface of the land above, and had become partly imbedded in the soft slaty and clayey shales. Meukar on the meridian gave the latitude of this camp 34° 1′ 28″ S.; and abrupt red sandstone-hills, flat-topped and peaked, rose up around it in every direction.

The inlet which receives this river being that on which our native had been informed a French whale-ship had procured coal for use, I determined on giving it a close inspection, and with that view re-commenced our descent of the river on the morning of the 28th of December, keeping as near as possible to it, in order to watch the indications. The river was here in pools in an open valley, half a mile wide, well supplied with spear, kangaroo, and other good grasses, growing among yeit-trees and the mainung-wattle, both of which indicate a superior soil. At less than a mile from our camp, a tributary joined from the right, opposite to an elevated quartz-slope, almost a cliff, on the left bank. The valley soon afterwards contracted to a width of 200 yards, and became cliffy and steep; shales again appeared in abundance on the left bank, crowned by a superincumbent mass of ironstone, but the intervening bed of the river would not afford a practicable passage by which we could get at them. They appeared however to dip as for-

merly, 45° to the S.E. The general direction of the river was here to S. by E. ½ E., for nearly three miles; its valley was narrow, and filled with slaty shales, blending with quartz; all the water in its long pools was bad, and the banks were so contracted, precipitous, and rugged, it was frequently necessary to reconnoitre far ahead before we could venture to advance with our weary horses.

Two tributaries now fell in from the right, within a short distance from each other, leaving a projecting grassy hill between them; and down a long reach of the river itself, East Mount Barren appeared in sight, bearing S. 13° 30′ W., at the distance of sixteen miles. Two miles below this the river cuts its way through a bed of shales, leaving them in perpendicular walls on each side, 100 feet apart, and little less in height, with red sandstone above the shales, and scrubby vegetation on the top of all. From the strong and decided echo among these singular cliffs, I called the place Echo Glen, and immediately below it had the satisfaction to observe the valley of the river open out, and again become grassy. From north-eastward at the glen, its direction changed to S.E.; well-grassed flats, 200 yards in width, occasionally occurred, and in a steep cliff of considerable elevation on the left bank, we thought the dip of the shales had increased from 45° to 60°, but could not afford to cross over for a more minute examination. Half a mile below this no shales appeared at the surface, but red sandstone took their place for 300 or 400 yards, and then the white and yellow cliffs re-appeared, with a dip not exceeding 2° to the south-eastward, and the river at their base. Here the country became much more open; good grass appeared along the valley of the river to the S.E. and eastward, and we appeared to be rapidly receding from all indications of the coal formation.

It was hereabouts we again fell in with some horse-tracks of Mr. Drummond, together with the remains of one of his encampments; but, from their appearance, we had little hope of falling in with that enterprising botanist himself, except by accident. From the dip, and open character of the country to the S.E., it was evident the estuary was not far off, and I therefore took up the best situation we could find, with good water and grass, where our exhausted cattle could recover a little, while we effected its examination. This camp was on a chain of low swamps, filled with samphire and green rushes, in a broad flat valley, which drained into the river about a mile lower down, and Middle

Mount Barren bore from it N. 87° ½ E., distant seven or eight miles. Traces of kangaroo were everywhere abundant, together with some of emu, and the bones of both were plentifully scattered around two large and very recent huts of natives, near our camp, which seemed to have been occupied by them within the last two days, for the branches which had been used in their construction were still green and fresh. Like most of the huts or shelters we had seen scattered over several hundred miles of country, these were of very rude and primitive construction, having been formed by merely placing broken-off branches in a semi-circle, and resting their broken ends in a strong forked support, sloping towards them in front. The fire, which always forms part of a native's encampment, is invariably small, and without flame, and is made within or without the support in front, according to the size of the hut, or to the number of persons it is intended to shelter. Near rivers or swamps which produce the Tea-tree (*Melaleuca*), its paper-like bark is used to cover in the huts, and is very loosely and carelessly thrown across straight sticks stripped of their leaves, stuck in the ground, and arched over to a general interlocking at the top.

Having seen the camp established, and the worst of our horses feeding on the choicest spots of soft green grass, which had been selected for them, I started with Messrs. Gregory and Ridley, and the native, at four o'clock, mounted on the best of our steeds, to reconnoitre the country in advance, and prepare for a more full examination of the estuary on the morrow. In less than two miles it came in view, about a mile to the E.S.E., presenting a fine sheet of open water, into which projected several prominent headlands, promising well for deep navigation; but no opening could yet be seen to the sea. In the upper part it received some open reaches of our river, near which were also some open lakes, and, further eastward, two of a sandy salt character, seemingly at this time quite dry. Beyond these we came out, at the end of a mile, upon the low swampy north-west shore of the estuary, abreast of the river's mouth, and worked our way south-eastward, to examine a lofty, bold projection of yellow and reddish cliffs, which formed a prominent and not unpleasing object on the estuary's northern shore, three or four miles further on. As we got into its neighbourhood, the land became exceedingly rocky, broken, and rough; deep, precipitous ravines, which would have required a long time to examine, were found deeply to indent the shore, and the projecting abutments between them were overhanging

sandstone cliffs, washed by the waters of the estuary. Leaving Bob in charge of our horses, we scrambled and climbed about, examining all we could find accessible; but when the sun disappeared behind the opposite hills, the main headland was still three-quarters of a mile distant to the southward, and it would have been quite dark before we could reach it, across the thick scrub which crowned its summit. The mouth of the estuary being also observed to be about two miles distant in the S.E., and the flat summit of Middle Mount Barren, bearing N. 67° E., at the distance of three miles, we remounted, and reached our camp soon after eight o'clock.

Next morning (Dec. 29), with the same party, the examination of the estuary was resumed, by passing round its opposite shore. Crossing the river half a mile S. by W. from our camp, it there occupied a straggling samphire-bed, nearly dry, and took a wide sweep round the margin of a rich flat of good kangaroo, spear, and other grasses. At the far side of this flat, a tributary joined from the westward, out of a steep, cliffy valley, and the river itself became full between its banks, winding with rather a tortuous course to the S.E. Sandstone cliffs, 60 or 70 feet high, rose from its southern shore. In some places these cliffs and the mass of rubbish at their base, approach so near the deep, open river, that we had scarcely room to pass, and could not avail ourselves of any occasional shallows in the river's bed, on account of the softness of the light blue clay which composed it. Hereabouts the dark red sandstone again made its appearance beneath those of lighter colour, but none of them had as yet any decided dip. As we descended, the river increased its open width to 100 yards, opposite to the mouth of a lake in connection with its left bank, the whole of which shore is for several miles very low, sedgy, and at times under water. The depth is here however much diminished; both banks and bed are of clay and ironstone, with many sharp masses of the latter showing themselves above water, where the broad wide mouth of the river joins the estuary. Remarking a long, low island, which divides that mouth into two channels, we passed out on to the shore of the estuary, and found both the latter and the steep banks which rise up from it extremely rugged and thick. Low cliffs of red and white sandstone abutted on the shore, and the intervening spaces were covered thickly with a lining of stunted Tea-trees and salt-water bushes, obliging us to wade into the treacherous estuary in order to pass them. Round the south side of

one very prominent projection, only three-quarters of a mile W. 15° N. from our steep headland of the preceding day, a cove, half a mile wide, and deep, extended to the westward, and received at its head a small streamlet, at this time dry, winding through a steep cliffy valley, grassy at its mouth. Red sandstone, and a slaty, shaly rock, were here prevalent, together with an outcropping of laminated quartz.

The eastern side of the cove above mentioned, was formed of another steep red and yellow cliff, similar to that on the opposite shore. Its ridge was extremely rugged, steep, and thickly scrubbed, and not finally surmounted without much scrambling and tearing; but all bruises and broken shins were soon forgotten, when, at the seaward side of the cliff, the same kind of shales lined the shore as those we had seen in the vicinity of the coal. With raised hopes we proceeded, and contended against every obstacle, but, as usual in these close proximities to coal, the country was so rough and intricate, that, notwithstanding our great eagerness to move on, the whole party were frequently hemmed up into the smallest possible space, without power to stir another foot until a new opening could be cleared. In our desire to avoid these formidable obstacles to our progress, and save time and distance as much as possible, we took advantage of every opportunity to wade in the estuary whenever circumstances permitted; but, as the water was thick, and its depth not always apparent, our horses' legs were sometimes endangered by their plunging suddenly into holes amongst the sunken rocks. Such an accident threw one of them on his side, and caused some apprehensions for his limbs, and even for his life, before he could be unloaded and got out again.

The shales we here saw, on our E.S.E. course of about a mile, were crossed by us obliquely, as they rose out of the estuary, and lay in the general direction between W. 20° S., and W. 27° S., with an uncertain amount of dip to the S.E., or S.E. by S., of about 45°. They then disappeared under the steep white sand-dunes of the sea-coast, which were covered thickly with flags and scrub. Below the shales, the estuary contracted rapidly from 1½ mile to a width of 300 yards, and in some places even to 150 yards; and the depth of water in this narrow pass soon diminished to three or four feet, on a soft muddy bottom. A mile and a half from the shales, through much thick tangle, took us to the mouth of the estuary, which we found about a quarter of a mile wide, and choked up by a dry bar of fine white sand, at least 300 yards

across to the sea rollers. From appearances within this bar, and from the general absence of marine shells on the shores of the estuary, it seemed likely that the sea seldom, if ever, broke into it, but rapidly closed up again any opening which occasionally might be made across the bar by the accumulation of water within, after heavy rains. The small bay outside was sandy, and apparently clear of rocks, but was somewhat shoal near the beach, and could afford no shelter to shipping from the strong S.E. winds of summer. From all northerly and S.W. winds it seemed perfectly secure; and boats would find the best landing at nearly all times where the high rocky shore commences at the south end of the bay. The water there is smoother than in other parts of the bay more exposed to the S.E: and good landing might be secured by means of a very short jetty. From the bar, Middle Mount Barren bore N. 47° ½ E., three miles distant.

(*To be continued.*)

BOTANICAL INFORMATION.

Oxford Herbarium.

Appended to an excellent and very useful popular guide to the Botanic Garden of Oxford (second edition), by Dr. Daubeny, that gentleman has given a very interesting catalogue of the several collections which now constitute the Hortus Siccus of this celebrated University. For above a century Oxford had been famous in the possession of the herbaria of our older botanists of the highest eminence, viz. of Morison, Sherard, Dillenius, etc.; and now that the Fielding Herbarium has been added, Oxford will probably rank second to no University in the world for the extent and value of its herbarium. The Heads of the University have done themselves much credit by the manner in which they have recently made provision for these several collections, and for the liberal manner in which they are made available to the public; but we know too, that, but for the disinterested and generous exertions of the present Professor of Botany, these measures would never have been carried.

We are happy to record in our pages the enumeration given by Dr. Daubeny.

1. The Collection of Dr. Morison, Danby Professor of Botany from 1670 to 1683.

This Herbarium contains 5319 species and varieties. The specimens are mounted each on a half-sheet of white, placed between a sheet of coarse brown, paper, 15 inches by 10. The arrangement is that of his work entitled 'Plantarum Historia,' of which the second volume only was published by himself, and the third by his successor, Bobart. They relate to herbaceous plants, with a supplement for Mosses, Lichens, Algæ, and other of the Cryptogamia. The first volume, relating to trees and shrubs, has never appeared, but the specimens intended to illustrate it are preserved in the Herbarium. The specimens accordingly are placed under fifteen classes, having the following titles. The first five sections are described in vol. ii. of the work.

1. Scandentes; Ex. Asparagus.
2. Leguminosæ; Ex. Vicia.
3. Siliquosæ; Ex. Brassica.
4. Tricapsulares hexapetalæ; Ex. Asphodelus.
5. Tricapsulares aliæ; Ex. Campanula; *described in the third volume of the work.*
6. Corymbiferæ; Ex. Tanacetum.
7. Papposæ lactescentes; Ex. Lactuca.
8. Culmiferæ: Ex. Grasses. *N.B. These are placed by themselves in a folio volume.*
9. Umbelliferæ; Ex. Conium.
10. Tricoccæ; Ex. Euphorbia.
11. Verticillatæ; Ex. Lavandula.
12. Multicapsulares; Ex. Pæonia.
13. Bacciferæ; Ex. Solanum.
14. Capillares; Ex. Filices.
15. Anomalæ; including many flowering plants which he was at a loss to arrange, and likewise Cryptogamous ones, followed even by Corallines.

2. Bobart's Collection.

A collection in twelve quarto volumes, containing about 2000 specimens, with the English and Latin names attached, probably made by Professor Bobart.

3. Sherard's Herbarium, presented to the establishment in 1726.

The specimens are mounted in the same manner as Morison's. They

occupy six cases, each of which contains twenty-four compartments. It is divided into six parts.

		Specimens.
1.	Consisting of British, contains about	2071
2.	„ European, exclusive of British . . .	6102
3.	„ American	2938
4.	„ African, chiefly from the Cape of Good Hope, and the Island of Madagascar	1192
5.	„ Asiatic, including an interesting collection from Siberia, collected by Hebenstreit and Dr. Amman, arranged by Dr. Sibthorp. A few also from Tournefort . . .	2241
6.	„ Miscellaneous, including presents from Haller .	248
	Total	14,792

This arrangement does not appear to be very strictly adhered to, since amongst the European are specimens which are regarded as indigenous in Tartary, Siberia, Persia, etc.; but it is to be regretted that the localities are rarely given; many even have no specific names attached. The Herbarium was re-arranged some years ago by the late Dr. John Sibthorp, according to the Linnæan system, and the Linnæan names were appended to the greater number of species.

4. C. Du Bois'* Herbarium.

This occupies no less than seventy-four folio volumes, each containing on an average about 180 specimens, so that the entire number of plants cannot be less than 13,000.

From this however a deduction must be made, as there are many duplicate specimens.

They are mostly in excellent preservation, and are often beautiful specimens. They are neatly mounted on white paper, with the names attached, of the plants, and of the persons who presented them; the two principal donors being Mr. Stonestreet and Dr. Bulkley. The arrangement is that of Ray's History of Plants, commencing with Corallines (then regarded as vegetables), and proceeding upwards through Fuci and Fungi to the more perfect sorts of plants.

5. Dillenius' Herbarium of Cryptogamous plants.

Small but valuable, both from the goodness of their preservation,

* Charles Du Bois was Treasurer to the East India Company, and had amassed a vast collection of East India Plants.

and as the original specimens from which this great authority in Cryptogamous Botany derived the drawings engraved in his valuable work, entitled 'Historia Muscorum,' which, as only 250 copies were ever printed of it, has since become scarce.

In the Library belonging to the Botanic Garden is a copy of the entire work, and likewise one, of the Plates alone, as well as another accompanied with an abridgment of the letterpress; prepared by Dillenius himself, but never published. The subjects of the volume were all drawn and engraved with his own hand. The specimens are 575 in number, belonging for the most part to the families of Algæ, Musci, and Lichenes.

There is also a collection of British plants by Dillenius, intended to illustrate the third edition of Ray's Synopsis.

In alluding to the contributions made by Dillenius and Sherard to the botanical treasures of the establishment, we must not forget the Pinax, begun by Sherard, which was nearly perfected by himself, when death suspended his labours, and prevented the publication of the results of so many years' patient labour and elaborate investigation.

The original Pinax by Gaspar Bauhin, of which this was intended as an enlarged and corrected edition, professed to be an index to the works of Theophrastus, Dioscorides, Pliny, and the Botanists of modern times, giving the names of the plants noticed by them, with their synonyms and descriptive characters.

Sherard's and Dillenius' Pinax, of which the greater part is still preserved in MS. in the Library of the Botanic Garden, occupies no less than 446 packages, divided into 11 books and 116 sections, the plan and arrangement of Bauhin being adopted as the basis, but the additions being exceedingly numerous.

6. Dr. John Sibthorp's Herbarium.

Amongst these are the original specimens engraved in his magnificent 'Flora Græca,' but there are likewise many more, the whole consisting of about 1600 specimens. They are arranged according to the Linnæan system, and have lately been mounted by Mr. Baxter, sen.

7. Dr. Shaw's Herbarium.

This is the collection of Dr. Shaw, the celebrated traveller in Barbary, and contains the specimens which have been engraved in his work.

It is an extremely neat collection, well preserved, and very carefully mounted on thick white paper with ornamental borders, each specimen enclosed in a folded sheet of stiff brown paper with gilt edges. The plants are arranged in alphabetical order, and were named, it is said, by Dillenius himself.

8. East Indian Herbarium.

A collection made by, or under the direction of, Dr. Wallich, and presented by the East India Company. They consist of about 1000 species or varieties from India, named, and mounted on writing-paper.

The arrangement we have adopted in classifying them is that of Jussieu as improved by modern Botanists; the system in Lindley's 'Natural System,' second edition, being that followed.

Besides the above, there are many smaller collections, illustrative of the plants of particular countries or tribes. Thus there is a small collection from the East, presented by Lord Macartney, arranged after the Linnæan system, and for the most part named.

Another, consisting of about 1000 specimens, contains many very beautiful ones from the east and west coast of South Australia, from the Blue Mountains, etc.; likewise from Van Diemen's Land.

There is a collection of about 1100 specimens brought by myself from the United States; a smaller one from certain parts of Spain; and a general collection arranged after De Candolle's Prodromus, consisting of about 1900 specimens, the greater part of which were brought by me from Switzerland and the contiguous parts of the Alps.

It would be superfluous to enumerate many other detached collections which we possess; but the following estimate of the number of specimens may give an idea of the extent of the whole collection of dried plants preserved at the Botanic Garden.

Morison's	5,319
Bobart's?	2,000
Sherard's	14,792
Du Bois'	13,000
Dillenius', of cryptogamous	575
Sibthorp's	1,596
Shaw's	662
Lord Macartney's	867

From the United States	1,104
South Australia	1,000
Dr. Wallich's	1,021
Dr. Daubeny's private collection	1,900
	43,812

I must not forget to notice the valuable collection of drawings of the Animals of the Levant, executed for Dr. Sibthorp by his travelling companion and draughstman, the celebrated Ferdinand Bauer, universally admired for their fidelity, and containing some still undescribed specimens. They consist of 11 drawings of Quadrupeds, 44 of Reptiles, 122 of Fish, and 115 of Birds.

We are also indebted to Dr. Sibthorp for one of the only two copies ever struck off from the plates engraved by order of the Emperor, from the celebrated MS. of Dioscorides with illuminated figures, preserved in the Imperial Library at Vienna.

One of these copies, it appears, was presented by the elder Jacquin to Linnæus; the other to Sibthorp, when he passed through Vienna on his way to Greece, in 1786.

The MS. was procured by Busbequius, the Emperor's Resident at Constantinople, about 1560, and is said to have been copied at the expense of Juliana Anicia, daughter to the Emperor Flavius Anicius Olyber, about the year 492.

Our copy contains 410 figures of plants, to which Dr. Sibthorp has attached the Greek names, and, in spite of their rudeness, may be useful from their antiquity, in enabling us to identify with modern plants those described in that early authority on the Materia Medica, especially as they are said to agree with the figures contained in a still earlier MS. of the same author, existing in the Library at Naples.

Mr. Baxter, the former gardener, who has now resigned the more active duties of his post to his son, has lately completed a catalogue of the contents of this Herbarium, which, it is hoped, will render it more generally useful and accessible.

The above collections however, although, as we have seen, extensive, and, considering the antiquity of most of the specimens, in a state of very fair preservation, have been in a great degree superseded by the valuable donation made to the University in 1852, by the widow of the late Mr. Fielding of Lancaster.

(*To be continued.*)

Collections of Dried Plants on sale with R. F. Hohenacker, at Esslingen, near Stutgart.

Metz; pl. Indiæ Orientalis. Sect. V. (Pl. Nilagiricæ, Sect. II.) 200–300 species, £4. 10*s.*—£3. Determined by Messrs. Bentham, Fenzl, Hochstetter, Lindley, Mettenius, Miquel, von Schlechtendal, C. H. Schultz, and others.

Lechler; pl. Chilenses (Provinciæ Valdivia). 100–200 species. Determined by the same botanists, and Messrs. Grisebach, Von Flotow, Montagne, and W. P. Schimper, £1. 5*s.* 9*d.*—£2. 11*s.* 6*d.*

Dr. Philippi; pl. Chilenses (Provinciæ Valdivia et Andium altiorum). Determined chiefly by Professor Grisebach. 50–100 species, 12*s.* 11*d.* —£1. 5*s.* 9*d.*

Lechler; pl. insularum Maclovianarum (Falkland Islands). 25–50 species, 8*s.* 7*d.*—17*s.* 2*d.*

W. Schimper; pl. Abyssiniæ, ed. ii., a Prof. Hochstetter revisa. 100–400 species, £1.—£4.

Huet du Pavillon; pl. rariores Alpium Helvetiæ (imprimis Valesiæ), Sabaudiæ, Jurassi, et ditionis Genevensis. 200 species, £1. 4*s.*

Professor Th. Orphanides; Flora Græca Exsiccata, centuriæ I.–III., £4. 16*s.* 5*d.*, will be continued.

Algæ Marinæ Siccatæ, Sect. I.–III. 3 vols. folio, each containing 50 species, at the price of 12*s.*, will be continued.

Herbarium normale pl. officinalium et mercatoriarum; text by Professor Bischoff, sect. 1; 220 species, £2. 7*s.*; will be continued.

NOTICES OF BOOKS.

Sikkim-Himalayan Plants.

Dr. Hooker is preparing for publication, in a handsome folio volume, with twenty-four plates (uniform with 'The Rhododendrons of Sikkim-Himalaya') and an illuminated title-page, price five guineas, coloured, 'Illustrations of Sikkim-Himalayan Plants,' chiefly selected from drawings made in Sikkim under the superintendence of the late J. F. Cathcart, Esq., Bengal Civil Service; the plates executed in lithography by W. Fitch.

The principal object of this work is, by the publication of a series of botanical drawings, executed in the very highest style of art, to introduce to the notice of the public a selection of Sikkim-Himalayan plants, which, from their beauty, novelty, and interest, are eminently worthy of cultivation in England; and, at the same time, to record the great services rendered to Himalayan botany by the late J. F. Cathcart, Esq., Judge in the Bengal Civil Service.

Attracted by the publication of the 'Sikkim Rhododendrons,' Mr. Cathcart visited Dorjiling, in the Himalaya, in 1849–50, with the view of furthering botanical science by employing artists, at his own expense, in delineating the magnificent plants of those mountains. During his residence there several artists were kept constantly at work under Mr. Cathcart's and Dr. Hooker's superintendence, and coloured drawings of nearly a thousand plants were made. It was Mr. Cathcart's intention, on his return to England, to have published (also at his own expense), in conjunction with Dr. Hooker, a very large selection of these, in the form of the 'Sikkim Rhododendrons,' but his lamented death (at Lausanne, in 1851), when on his homeward journey, frustrated this munificent intention.

The invaluable collection of coloured drawings has been presented to the Museum of the Royal Gardens of Kew by Mr. Cathcart's sister; and it is from a selection of these drawings that Dr. Hooker is preparing a botanical work, as a suitable tribute to the memory and love of science of his late friend.

In undertaking its publication, Dr. Hooker has availed himself of Mr. Fitch's talents in the execution of the plates in lithography, and of his own drawings, also made in the country; and has further supplied the botanical analyses and descriptive matter.

From the great expense attending publications of this description, Dr. Hooker (at whose risk it is undertaken) is obliged to regulate the number of copies struck off, by that of subscribers; and as it is obviously impossible to keep the lithographic stones, he earnestly desires that persons who may wish to possess the work, will oblige him by sending their names at their earliest convenience.

BRYOLOGIA BRITANNICA: *by* WILLIAM WILSON, ESQ. (*being a new and greatly improved Edition of* HOOKER *and* TAYLOR'S Muscologia Britannica.)

The work on BRITISH MOSSES, about to be published, is not a mere compilation; but the result of long and diligent study of the tribe, extending over a period of nearly thirty years. Since the MS. was prepared for the press, seven years ago, it has undergone careful revision; and every species has been described from actual observation, except in a few unavoidable instances,—in most cases after long and familiar acquaintance, and after repeated examination and comparison of numberless specimens, both growing and in a dried state. The Herbaria of authors have been largely consulted; and authentic specimens of Hedwig, Swartz, Palisot de Beauvois, Richard, Bridel, Dickson, and others, have been duly investigated, and rendered available in the determination of doubtful species. The synonyms, especially, have been carefully studied.

In the plan of the work, it has been thought best to conform to the views of Bruch and Schimper, as given in their excellent 'Bryologia Europæa,' whenever reasons to the contrary were not apparent.

To render the work more accessible to persons not familiar with the Latin language, English names of the species have been added; and the technical terminology used in the specific characters and descriptions, will be explained by a glossary. Analytical and synoptical tables of the genera, and a comparative view of the genera in the second edition of 'Muscologia Britannica,' are appended to the present work, which contains upwards of 150 additional species, nearly all of which are illustrated by figures, added to those of the second edition of Musc. Brit., which have been corrected so as to be rendered available in this; and, in order to keep the volume within a moderate compass, the citation of synonyms is as brief as possible. The work will occupy about 450 pages of letterpress, in octavo (of which three-fourths are already printed).

It is hoped that any one desirous of studying the tribe will find this a serviceable manual, and, should further assistance be needed, it is intended to issue sets of authentic specimens (obtainable on application to Mr. W. Wilson, Warrington), at as moderate a price as will be reasonably remunerative for the trouble of preparation; the materials for such sets being already at hand.

STEUDEL, E. G.: *Physicus Erlangensis; Synopsis* PLANTARUM GLUMACEARUM. Fasc. 1. Gramineæ. Large 8vo. Stutgart.

This number commences, at once, and without any prefatory matter, with a character of the Natural Order *Gramineæ*, and (we presume, with the intention of adopting the exact arrangement of Kunth) with the *Oryzeæ*. Then follows *Phalarideæ*, and the third tribe is *Paniceæ*. The genus *Paspalum*, which in Kunth's Synopsis reckoned 179 species, given without any divisions or sections, here numbers 262 species, divided into groups, with characters such as the following, which, we fear, will practically be found wholly unavailable. "A. Spiculis pusillis vel minimis." "B. Spiculis plus minus lineam æquantibus, parvis magnis maximisque." "C. Species quoad magnitudinem absolutam minus distinctæ." "D. Species quoad sectiones priores vel omnino minus notæ."—*Panicum*, in Kunth, amounting to 421 species, is here exactly doubled, 841 species finding a place here. Rarely are any remarks given, or diagnoses, beyond those of long specific characters; and we fear a working Botanist will find these as unintelligible as those of Kunth have proved to be: and how many of these 841 species of *Panicum* may be good, we must leave to the judgment of future botanists.

Monograph of Tropical American Oaks.

Dr. Liebmann, of Copenhagen, the distinguished traveller in Mexico, and the worthy successor of Professor Hornemann in the Botanical chair of the University of Copenhagen, has in a very forward state a History, with numerous figures (we believe, in folio), of the Oaks of tropical America. His own collections of these are very considerable, and those of other Herbaria have been made available to him; and we are sure that the publication will be as acceptable to all botanists, as it will be honourable to the author. We learn that here, as is the case in all extensive genera, Dr. Liebmann has found it necessary to reduce very considerably the amount of book-species.

ERRATUM.

At p. 354 of our last volume (5), Mr. Nuttall named a new species of *Rhododendron*, *R. pumilum*, without observing that the name was previously given to a species by Dr. Hooker. Mr. Nuttall wishes the name of *R. leptocarpum* to be substituted for his *R. pumilum*.

Remarks on DOORNIA *and* RYKIA, *two new genera of Screw Pines, preceded by some general observations upon that class of plants; being the substance of a Lecture, delivered on the 27th May,* 1854, *before the Royal Academy of Sciences at Amsterdam; by* DR. W. H. DE VRIESE, Member of the Academy.

There are some families of plants, which, on account of their form, aspect, and locality, particularly engage the attention, not of botanists alone, but of every observer of nature. They are called Physiognomic Plants. What we know of the diffusion of plants over the surface of the earth, teaches us to understand not only that intimate connection existing between the plants and the soil, but also that existing between the plants and all other external circumstances, and makes us recognize this connection as the first and chief cause of their distribution. Do we need examples? I invite your attention only to the appearances of vegetation in our own country (Europe);—to our almost boundless tracts overgrown with *Calluna vulgaris;* to our Fens, covered with *Sphagna;* to the Pine-woods, in which here a Moss-vegetation, in another place *Vaccinium Myrtillus,* or in another, the Eagle-fern, *Pteris aquilina,* often develope themselves in gigantic forms; and all these in their peculiar localities, and in such number, that they constitute eminently the chief character or form of plant. In the more northerly regions may be seen the *Cenomyce rangiferina,* or Reindeer Moss, which covers the soil for many square miles; or the dwarf Birch, *Betula nana,* a sort of tree which scarcely attains a few inches in height, but clusters in myriads over a small space. These plants give us a just idea of what we call social growth.

The countries lying between the tropics, present the most physiognomic forms of statelier development. The Palm form is found principally in Mexico and South America. The East Indian Archipelago, Java and the Philippine Islands are richest in Ferns, and chiefly in Tree-ferns. The *Rhizophoræ* affect the neighbourhood of the mouth of great rivers: they may be called, for distinction, eminently coast-plants. They are generally found where great rivers are discharged into still bays or coves of the sea, where there is but little surge. They are pretty shrubs (says Junghuhn), attaining a height of ten to twenty-five feet, and of such peculiar aspect, that no other instances are found in the vegetable kingdom. The stem does rise direct from the earth, but

rests on a sort of aerial roots, which shoot out in the form of rays, and afterwards enter the ground; and the plant, which stands as it were on stilts, is thus supported. There is also in the Tropical Flora another form of plants, which, by its particular development of stem, and by the aerial roots on which its stems are supported, and by many other qualities by which it is distinguished, in many respects agrees with the *Rhizophoras* (viz. that the *Rhizophora* is dicotyledonous), although in others it differs: I mean, the group of *Screw Pines* (*Pandaneæ*).

It is to this last family that I wish to direct attention for a few moments. Submitting the judgment of my communication wholly to those who are better informed, I flatter myself that this important family of plants will occupy more of the attention of naturalists, here and in East India, as well perhaps as elsewhere, than has hitherto been the case.

The real Screw-pines are unknown in the New World. The *Cycadeæ*, which have been carried thither, do not belong to this group, but form another and a separate one, which is pre-eminently American. The *Pandaneæ* are trees or shrubs, from which roots now and then shoot forth, and penetrate the ground, as in the *Rhizophores*, and support the stem, which might be said to rest on the top of a cone, which is formed by the union of the air-roots. The leaves are for the most part spirally arranged, in three rows; they are long and lanceolate, and surround the stem with their sheaths. The margins are generally spiny, and the dorsal nerve is especially so. The leaves which immediately enclose the flower, are smaller, often coloured, and they form as it were sheaths, which surround the spadix. The stems are of rather loose, woody structure, and (which is an exception among the Monocotyledonous trees) they are branched. The flowers are of distinct sexes, and the fruits grow in a concrete form, and yield, in some species, good food. They are placed, in the natural arrangement, between the *Aroideæ* and *Typhaceæ*. They differ sufficiently from the last, although they are not so easily to be distinguished from the first. The people compare them with the Pine-apple, and indeed one should be disposed to consider them gigantic *Bromeliaceæ*. There are some single forms of *Pandaneæ*, which agree with the American Bromelias, as far as the exterior of the fruit is concerned; but in their interior structure they have nothing in common. The *Pandaneæ* are remarkable, particularly in their monocotyledonous stem, which has a forked rami-

fication, and by the uniform spiral arrangement of leaves round the stem; so that the stem, where the scars of detached leaves are visible, resembles a screw, or cork-screw. They are met with chiefly on islands, and are particularly numerous in the Isle of France and Madagascar, where the *Pandani* are also found. The East Indian Archipelago is rich in these plants, as well as most of the tropical islands of the Old World.

It may cause astonishment that so characteristic a group of plants remained so long unknown, notwithstanding that the first botanists have occupied themselves with the research. Of the three genera classed by Lindley among the true *Pandani*, scarcely one is known, and that not in all particulars; I mean, the species of *Freycinetia* (Gaud.). *Marquartia* (Hasskarl) I have found mentioned, but not fully described. The numerous species of the genus *Pandanus* may be considered as sufficiently unknown.

The following historical researches will, I think, prove this:—In the second volume of the 'Hortus Malabaricus,' from plate i. to viii., and pp. 1 to 7, we find a number of *Pandani* drawn and described, of which we may take it for certain, that the greatest part are unknown, and are not to be referred to those forms with which we have more recently become acquainted. This the botanists have however attempted, with, in my opinion, but very moderate success.

Kaida (Rheede, i.–v.) must be *Pandanus odoratissimus*, L. fil. *Kaida Tsjerria* (R. viii.) is referred to *Pandanus furcatus*, by Roxb., Flor. Ind. iii. 744. I hold this last for a very good conjecture.

With respect to Rumph's 'Herbarium Amboinense,' we are not much the wiser. He enumerates the following sorts, to which we assign the names given by later authors, below.

1. *Pandanus verus*, t. 74. (*P. odoratissimus*, L. Suppl. 424. Willd. Sp. iv. 645. (excl. Jacq. Fr. et β.) Roxb. Fl. Ind. iii.)
2. *P. spurius*, t. 75.
3. *P. humilis*, t. 76. (Lour. Coch. 740. Jacq. Fragm. xxi. t. 14. f. 2. Willd. Ep. iv. 645.) (ex Kth.)
4. *P. silvestris*, t. 77.
5. *P. latifolius*, t. 78.
6. *P. moschatus*, vel *lævis*. (*P. lævis*, Lour. Coch. 741? Willd. Sp. iv. 646.)
7. *P. ceramicus*, t. 179.
8. *Folium Baggea verum*, t. 179.

9. *Folium Baggea maritimum*, t. 80. (*P. dubius*, Spr. Syst. iii. 897. confusus cum *dubio*, Kth.)
10. *Pandanus repens*. (geene afb.)
11. *P. funicularis*, t. 82. *Freycinettia strobilacea*, Bl. (Rumph. i. 156.)
12. *P. caricosus*, tabula adest in ms. inedita. *P. cariosus* (Rumph. Amb. iv. 154. Spr. Syst. iii. 897.)

According to some authors, the plant which Linnæus, in his Suppl. p. 424, has mentioned as *Pandanus odoratissimus*, is no other than the *P. verus* (of Rumph. Amb. iv. 139. t. 74), and the same as *Kaida* (Rumph. Mal. ii. t. 1–5), the same as *Keura odorifera* (Forst. Descr. 172), the same, in fine, as *Athrodactylis spinosa* (Forst. Gen. No. 75).

It is a plant which should be met with in East India, Arabia Felix, China, and the islands of the Southern Pacific Ocean (Kth.). We see this opinion embraced by Roxburgh (Corom. 1. 65. t. 94–96).

I am perhaps mistaken, but I have not been able to see on what certain ground the above-mentioned and other authors, to whom Kunth should be added (Enum. Plant. iii. 1841. p. 94), have adopted that synonym. Let what Rumph says (t. a. pl. cxli.) be just, viz. that the leaves which surround the blossoms are used on account of their sweet smell, wherefore the inland women lay them in their boxes with their clothes, and smear these leaves with sweet-smelling oil. The drawing however affords none, and the description only very little, reason for this conclusion, to which later authors have come. From the emitting of smell alone, to determine on the identity of recently known plants, and earlier published descriptions, is certainly rather rash, especially as Rumph has mentioned several other sweet-smelling *Pandani*. Of his *P. moschatus* (*lævis*, Lou.) he says, that the leaves which surround the blossom diffuse an odour, which the inhabitants compare with *Castari*, or Musk, but which most resembles a sweet-smelling ointment. This smell is so diffusive in the evening and at night, that the whole plain, where the tree grows, is filled with it as soon as the anthers are opened; but if this flower is let stand a little longer, the perfume goes off; it therefore must be cut, as soon as the smell is perceived.

An opportunity has been afforded at Amsterdam to make observations on the male blossoms of *P. furcatus*. It appeared that they emitted a strong smell, resembling *Convallaria majalis* (Miquel). These plants do this, not less in their natural situations, and original country. I advance this merely to support my own opinion, that the referring of

later described sorts to earlier drawings, is an uncertain standard by which to judge of the synonyms.

The brevity of the earlier diagnoses, as those of Linnæus, prove this assertion. I transcribe in part what is said in the 'Species Plantarum' of Willdenow (iv. 11. 645), by which it may be readily judged concerning the brevity, and the numberless plagiaries. I merely remark, that from what is now required in Systematic Botany, no one would be able to determine the genus *Pandanus* from this generic diagnosis, and that the characteristics of the species apply equally to any of them. The authors have but imperfectly known the plants they described, and have therefore described them imperfectly.

PANDANUS (*Gen. Pl. ed. Schreb. n.* 1481).

Masculi:—*Cal.* 0. *Cor.* 0. *Stam.* 1. *Fil.* subulatum. *Antheræ* cuspidatæ.

Fœminei:—*Cal.* 0. *Cor.* 0. *Styl.* bifidus. *Drupa* composita.

1. PANDANUS *odoratissimus.*

P. foliis dorso margineque spinoso-dentatis, fructu globoso solitario.

P. odoratissimus, *Linn. Suppl.* 424. *Forst. Pl. Escul. p.* 38*. *Forst. Prodr. n.* 355. *Roxb. Corom. v.* 1. *p.* 65. *t.* 94, 95, 96*. *Jacq. Frag. Bot. p.* 21. *t.* 13 *et* 14. *f.* 1.

Pandanus foliis linearibus ciliato-spinosis, floribus masculis odoratissimis, foliis floralibus albis, *Lam. Encycl. v.* 1. *p.* 367.

Pandanus foliis margine dorsoque aculeatis, fructu solitario, *Loureiro, Cochin.* 739.

Athrodactylis spinosa, *Forst. Gen. n.* 75.

Keura odorifera, *Forsk. Desc.* 172.

Pandanus verus, *Rumph. Amb. v.* 4. *p.* 133. *t.* 74.

Kaida, *Rheed. Mal. v.* 2. *p.* 1. *t.* 1–5.

Bromelia foliis margine dorsoque aculeatis, caule sulcato spinoso, *Fl. Zeyl. p.* 54.

β. Pandanus spurius, *Rumph. Amb. v.* 4. *p.* 142. *t.* 75.

Wohlriechender Pandanus, *W.*

Habitat in India *orientali*, Arabia *Felici*, China, *inque insulis* Maris Pacifici. (*v. v. s. fl. et v. s. c. fl. masc.*)

Arbor *pulcherrima.* Folia *spiraliter in ramis posita.*

Flores *masculi odoratissimi*, W. (*Sp. Pl.* iv. *v.* 2. p. 645.)

In regard to the synonym of Forster. The genus which is de-

scribed by that botanist is, I think, properly referred to *Pandanus*. From the drawing, however, it cannot positively be determined that this plant is identical with that of Roxburgh, in the Flora of the Coast of Coromandel.

Keura odorifera of Petrus Forskal (in the 'Flora Ægyptiaco-Arabica, descriptiones, etc.; after the author's death published by Niebuhr) appears to point at a *Pandanus*, which was imported into that country (172), and was distinguished by the strong perfume of the male blossoms, and for that reason is perhaps referred to *P. odoratissimus*. Touching what Jacquin has advanced in his 'Fragmenta Botanica' (p. 21. t. 14), there prevails some uncertainty about the agreement between Rumph and Rheede. It is said 'Singularissimæ et spectabilissimæ hujus arboris descriptio legi potest apud Rheede, *Rumphium*, Roxburghium aliosque."

He calls however the plates, to which he refers that *Pandanus* (viz. *odoratissimus*) of Rheede and Rumph, *Pandanus humilis*, Jacq.; not that which the authors have held for the *P. humilis* of Rumph, at p. 16.

It is unnecessary to recapitulate all that plagiarists have written relative to *Pandani;* suffice it to show what, in this department of the Flora of our East Indies, is established here and in Eastern India.

Professor Blume, in the Catalogue of the Government Botanical Garden at Buitenzorg (published at Batavia in the year 1853) has taken up three sorts of *Pandanus*, viz. *P. horridus*, R., *P. inermis*, R., and *P. odoratissimus*, K. They are not described. In his 'Rumphia,' vol. i. p. 155, he treats *de quibusdam plantis minus cognitis e familia Pandanearum;* but he says definitely, "Neque tamen hæc nostra investigatio magnificentissimos illos spectabit Pandanos, qui vel in sterilibus et saxosis harum insularum (v. c. Bandanensium) littoribus, insignem tropicæ vegetationis luxuriem et vigorem ostentant, et quorum adspectus eandem fere in animo admirationem et quasi stuporem excitat, quam palmarum incredibilis magnificentia."

In the Catalogue '*Plantarum in Horto Botanico Bogoriensi Cultarum alter, auctore* J. C. Hasskarl, Bataviæ, 1841,' seven sorts of *Pandanus* are represented as being in that Garden, viz. *P. latispinus* (Bl.), *P. furcatus* (Roxb., *horridus*, Rwdt.), *P. lævis* (Rumph, iv. 154), *P. caricosus* (Rumph. iv. 154), *P. humilis* (Rumph. iv. 143. t. 76), *P. inermis* (Rwdt.), *P. latifolius* (Rumph. iv. 139. t. 78), *P. Samak*, Hssk.; and besides another new genus already mentioned, *Marquartia* (Hssk.),

to which belong *M. globosa* and *M. leucacantha*. This last genus is said, in a note, to be a "genus medium inter *Pandanum* et *Freycinetiam;*" and this is very briefly described, and by no means so clearly as one would expect with a new and imperfectly known family of plants. It does not appear whether Hasskarl has treated and published it elsewhere (than in the Flora, 1842, Beiblätter, p. 14, and from there in Endl. Gen. Suppl. p. 1711). This may probably arise from a want of specimens. It only occurs in Endlicher's 'Genera Plantarum,' 1711; to which genus Hasskarl thinks he must refer all the *Pandani* of Kunth's 'Enumeratio,' from species 1 to 9, included.

In the 'Plantæ Javanicæ rariores' (Berol. 1848), Mr. Hasskarl has treated of two *Pandani*, which he refers to *P. furcatus* (Roxb.), and *P. lævis* (Rumph.); and in the Bot. Zeit. he has thrown some additional light on a few others. It is worthy of remark that neither Blume, nor Hasskarl, nor the botanists who have more lately visited our colonies, mention *P. odoratissimus*, L., which plant, following other authors, should be the *P. verus* of Rumph; but which Noronha alone mentions (Verh. Bat. Genootschap, v. 63), which cannot be the *P. odoratissimus* of the other authors, and thus must be considered as a new and till now unknown species.

We add to this, that a male plant of *P. furcatus*, is described by Miquel (in the Verh. Kon. Ned. Inst. van Wet. 3 Serie, iv deels, 1ste stuk, Amst., 1851, p. 22), and that our knowledge of the *Pandani* of the East Indies is limited to this.

It appears, from what M. Junghuhn says, that the flora of Java is rich in these beautiful plants; and it is equally clear, that as yet we have learnt but little special and fundamental of them. I am more convinced of this by the specimens received from Java through the kindness of Mr. Teysmann, and belonging to the so-named *Pandani*, but of which it is not to be assumed that they are referable to that genus.

The few objects that I offer, I think, serve to prove my opinion. I propose, as the result of my inquiries in the family of the *Pandaneæ*, to publish a paper under the title of 'Nova Genera et Species Pandanearum,' which will further elucidate the family and prove my position, that if we take the *Pandanus odoratissimus* of Linnæus as a type of the genus *Pandanus* (the fruit of which species is very well represented, in the Plants of the Coast of Coromandel, by Roxburgh) we may safely

conclude, that the hitherto known Java forms should be separated from the genus *Pandanus*. This is obvious from what Kunth has advanced in his 'Enumeratio' (iii. 1841, p. 94), concerning the plants which he attributes to the genus *Pandanus*. He takes up thirty sorts, of which scarcely one, viz. *P. odoratissimus* (and this not in all respects) can be received as known. It is rather to be called a list, or catalogue, which in many points has no more value than a gardener's list, so short are the descriptions of the species represented. The investigations of Bory de St. Vincent, and Aubert du Petit-Thouars, have indicated many sorts as growing on the Isle of France, Bourbon, and Madagascar; but from which enumeration it appears that we cannot sufficiently recommend researches in these islands, for of these plants we do not as yet know anything really. We are equally ignorant of the Australian species. The two sorts which Brown has mentioned, are only briefly described.

If we are really to advance in our knowledge of this family of plants, we must have coloured drawings of the plants in their natural state, with full descriptions; the flowers and fruit preserved in spirits; collect the dried leaves, describe them on the spot, or, if possible, send them to Europe. That this is particularly necessary with regard to the female plant and the ovule, is obvious, from the beautiful work of Gaudichaud, who, in the botanical part of his Voyage round the World in the corvette La Bonite, performed in 1835–7, shows the very plan to be adopted by those who would investigate the *Pandani*. Though many calm investigators may disapprove the far-stretched hypotheses of this botanist on the growth of the monocotyledonous stem, it is however admitted, by all who can value his labours, that Gaudichaud is one of the most eminent analytics in modern science. Also, in respect of *Pandaneæ*, the researches of Gaudichaud are excellent, although only known by drawings, to which no text is annexed. In his excellent analyses accompanying the plates in his admirable atlas of the above-mentioned work, M. Gaudichaud has enumerated the following new genera:—*Barrotia* (pl. 13), *Bryantia* (pl. 20), *Dorystigma* (pl. 13, 31), *Fisquetia* (pl. 4), *Vinsonia* (pl. 17, 23, 31), *Roussinia* (pl. 21), *Hombronia* (pl. 20), *Sussea* (pl. 24, 25, 38), *Jeannerettia* (pl. 25), *Heterostigma* (pl. 25), *Foullioya* (pl. 26), *Tuckeya* (pl. 26), *Eydouxia* (pl. 18), *Souleyetia* (pl. 19). Ten species of *Pandani* are proposed analytically. Among them, as among the new genera, are included, naturally, more of those of the old sorts:—*P. utilis* and *sylvestris* (a *Vinsonia*), *P. edulis* (*Hombronia*), *P. conoideus* (*Sussea*),

P. candelabrum (*Tuckeya*). We find further, here, a *P. Linnæi*, *P. Rumphii*, *P. Rheedii*, *P. Borgii*. We can only guess, but not determine, what may be meant.

My chief object in visiting M. Gaudichaud at Paris, in 1851, was to be enlightened upon his new genera and species, but in vain. He only spoke of what for many years has been his fixed idea,—the growth of the fibres in the stems of plants in a downward direction. He instantly produced numerous drawings and specimens to prove it; but, however beautiful, and in many respects admirable, they did not convince me of the truth of his theory. The time passed away, and I had learned nothing of that for which I had come. The French Academy, which soon had to lament the loss of St. Hilaire, Richard, and De Jussieu, was quickly deprived of the worthy Gaudichaud, and with him, perhaps, departed the hope that the botanical part of the Voyage of the Bonite would ever be completed.

Sir William Hooker, in 1853, published a drawing and description of *P. pygmæus*, Thouars (Desv. Journ. de Bot. i. 45; Kunth, En. iii. 99), in the 'Botanical Magazine,' t. 4786, accompanied with a sketch of the vegetation of the plant. His specimen had been cultivated during twenty years; it came from the Isle of France, and produced female blossoms at Kew in 1852–3.

The Botanical Garden of the Leyden University afforded, not long ago, an opportunity of making an observation which seems worthy to be communicated in this place; and which shows that the establishment of our higher instruction may serve for the diffusion of science, as, in the opinion of many competent persons, it should do.

On the 20th of May, 1828, twenty-six years ago, by the orders of my respected predecessor Professor Reinwardt, a *Pandanus* was bought at the sale of M. Faesch's plants at Westmeer, near Haarlem, by the present gardener, Schuurmans Stekhoven. This plant was then so small, that one person could easily carry it. It was called *P. reflexus*, and is now the ornament of the Garden. Its handsome foliage fills the house in which it grows, and justly excites the admiration of all who contemplate it. The height of the plant is 14 feet, the breadth of the foliage 8 feet, the height of the stem 4 feet, the circumference of the stem at the beginning of the leaves 2 feet, the breadth of the leaf-bases on an average 18 inches.

In December, 1852, one of the under-gardeners observed that the

plant had thrown out a female blossom from its centre, which was then 18 inches long, and so closely surrounded by leaves, that any one standing below could not see the flower. I immediately had this blossom, which was not probably very long blown, drawn; to which I now invite your attention. It was a female compound spadix, surrounded with lancet-formed sheaths, edged with white, strong spines. Of those spadices, which somewhat resembled unripe pine-apples, and which were twelve in number, I examined one immediately, to ascertain the position of the ovule, and what was in connection with it. I remembered to have seen this species in the conservatories of the garden at Paris, where it is also called *P. reflexus*, in which I have been supported by Wendland (Index Palmarum, Cyclanthearum, Pandanearum, quæ in hortis Europæ coluntur. Hanoveræ, 1854).

When at last, in 1853, the growth was complete, and no more change in the colours took place, I had the whole blossom cut off, and sent to my friend M. O. M. R. Ver Huell, Vice-Admiral of the Dutch Navy, who kindly forwarded the handsome drawing which I have had the honour to present to you, and which I hope soon to publish in my 'Nova Genera Pandanearum.'

I am come to the conclusion that this *Pandanus* must be the type of a new genus, which must be principally grounded on the structure of the fruit; and I venture to propose this genus, although of course I have not been able to obtain any ripe seeds. I call the genus *Doornia*, and will endeavour to give briefly its diagnostics.

Doornia.

(*Pandanus*, L. et auct.—*Athrodactylis*, Forst.—*Keura*, Forsk.)

Flores dioici. *Masc.* . . . . ? *Fœm.* Spadix compositus, thyrsoideus; spadicibus complanatis.

Ovaria in quoque spadice plurima, in phalanges connata, 3–4–5-na.

Ovula in singulo ovario solitaria, e basi placentæ parietalis adscendentia, anatropa.

Stigmata sessilia, depressa, versus unum latus directa, et poro ad basin laterali instructa.

Drupæ fibrosæ vel ligneæ, in singulo phalange 3–5, interposita materie fibrosa tenacissima conjunctæ et in unum corpus connatæ, vertice planæ; hæ drupæ faciunt conos plus minus regulares rhachi communi sive pedunculis oblique adscendentibus insertos; coni autem

ipsi apice latiores sunt, plerumque hexagoni, a parte inferiore, qua vicinis adhærent, sunt angustiores et fere turbinati.

Semina non aderant (quippe planta dioica).

Est habitus Pandanorum, nempe caudex arboreus, strictus; folia trifariam sunt disposita, imbricata, e basi latissima sub-amplexicauli elongato-lineari-lanceolata. Spadix est terminalis, spadices partiales sunt spathis elongato-linearibus involucrati.

Doornia reflexa; foliis longissimis reflexis lineari-lanceolatis e basi latiore inermi demum costa marginibusque spinosis, spinis e basi albida tandem angustatis acutis; thyrso terminali erecto triangulari; pedunculis oblique adscendentibus complanatis; spadicibus 12 compressis atro-viridibus, apice conorum latioribus ibique fusco-maculatis, ad planorum angulos lineatis.

I presume that this plant is a native of the Isle of France or Madagascar, because it is more than probable that the former owner received it from France.

When the blossom was fully developed, it was 1½ feet. The leaves at their bases about 1 foot broad, and in all 7 feet long.

The peculiar blossom, the compound spadices, the flat form of the spadices, the shape of the drupæ, the polyhedrous surface, and the flat surface at the top of the fruit, suffice to separate this *Pandanus* from the *P. odoratissimus* of Roxburgh's Flora of the Coast of Coromandel. If there appear other characteristics from the seeds and the male flowers, we shall then certainly determine this with more justice.

I dedicate this genus, *Doornia*, to the services of his late Excellency the Baron Van Doorn van West-Kapelle, late Curator of the University of Leyden, to whose patronage Natural Science in our country is much indebted, and whose name will be ever remembered by all who had the happiness to know that excellent man, and to appreciate the eminent qualities of his understanding and noble heart.

Did space allow, I would call your attention to another genus, of which the old *Pandani* (viz. the *P. furcatus*, Roxb.) afford the type. I must however confine myself to the indication of a specimen in spirits, lately received by me from Java. Its distinguishing characteristics are: a one-celled fruit, with a columnar top, hollow internally, and separated from the rest of the fruit, while the style grows out in a hard, horny mass, which is divided into two. The whole structure of the fruit differs much from all the other forms with which we are acquainted,

and resembles, in some degree, the male blossoms of *Cycas circinalis;* while it corresponds neither with the *P. odoratissimus* of the Flora of Coromandel, nor with the former genus, *Doornia.*

I dedicate the new genus to the highly honoured member of our Academy, whose sudden death we lament; whose former assistance we have been privileged to experience, but whose place we now see empty. His zeal and knowledge, both in this new Institution and in the First Class of the earlier Royal Institution of the Netherlands, we had good cause to know; and M. Ryk, a short time ago, gave a proof of them in the honourable work undertaken at the request of the Academy (in conjunction with our fellow-members Messieurs G. I. Mulder and A. H. Van Boon Mesch) to enlighten Government on the causes of the spontaneous combustion of goods loaded in ships.

I call this new genus *Rykia,* to associate also with science the name of the Vice-Admiral J. C. Ryk, by whose death the country is deeply affected, and in whom we all lament a zealous fellow-labourer, a man of diversified knowledge, and a warm supporter of our King and country. Among the names of distinguished naval officers already associated with botanical science, as *Dumontia, Durvillea, Freycinetia,* the genus *Rykia* will find a place in the Botanical System. I give the following diagnosis of this genus:—

RYKIA (*Pandanus*, etc., Auctt.).

Flores dioici.

Masc. Spadix compositus, dependens, bracteatus.

Stamina fascicularia, in stipite communi compresso, 9–11–13, fere biserialia.

Antheræ erectæ, lineares, ultra connectivi loculos productæ, acuminatæ, dorso adnatæ; loculi antherarum paralleli; pollen globosum.

Fœm. Spadix simplex, ovatus, erectus, stipitatus.

Ovaria simplicia, unilocularia.

Ovulum unicum, e placentæ basi parietali adscendens.

Drupa angulata, fibrosa, elongata, in medio continens putamen ligneum, uniloculare, sursum in processum polyhedrum terminatum, et apice bicornuto, cornubus mucronatis instructum.

Semen unicum; sed hujus tantum rudimenta vidi.

Rykia furcata (P. furcatus, *Roxb.*).—Char. speciei huc referendæ, ab auctoribus sunt expositi; ad hos igitur hic loci liceat referre.

Revision of the Genera CRESCENTIA, PARMENTIERA, *and* KIGELIA; *by* BERTHOLD SEEMANN, Ph.D., F.L.S.

In a paper read last winter before the Linnean Society of London, I divided the Order *Crescentiaceæ* into two sections (*Tanæcieæ* and *Crescentieæ*). I now beg to offer a revision of the genera composing the latter section (*Crescentieæ*), all of which are characterized by a deciduous, irregular, spathaceous, or bi-parted calyx. In this revision the number of species will be found considerably reduced. To show that this reduction is not owing to any extravagant theoretical views I might be suspected of holding on the limits of species, I shall proceed to give my reasons for making the changes to which I have alluded. I may also remark, that I have observed the plants here discussed, with the exception of one (*Parmentiera edulis*, DC.), in a living state, either in their native country or in European gardens; and that I have examined dried specimens of *all* of them in the herbaria of Linnæus, Hooker, Bentham, the Linnean Society, and the British Museum, and obtained besides information concerning them in the shape of tracings and descriptions from various botanical friends.

De Candolle has enumerated (Prod. ix. 246. sq.) nine species of *Crescentia* (*C. Cujete*, L., *C. cuneifolia*, Gard., *C. acuminata*, H.B.K., *C. cucurbitina*, L., *C. edulis*, Desv., *C. aculeata*, H.B.K., *C. alata*, H.B.K., *C. trifolia*, Blanco, and *C. ovata*, Burm.); Walpers has added (Repertorium, vol. vi. 517) two more (*C. obovata*, Benth., and *C. lethifera*, Tussac); and our gardens contain another one (*C. macrophylla*, Seem.); —in all, twelve. The species upon which the genus *Crescentia* was founded is *C. Cujete*, Linn., distinguished from all others by its fasciculate leaves, *all* of which are simple, and its fruit, the shell of which is so hard that it can only be broken by the application of an axe or some other sharp instrument. To this species I have added as a synonym *C. cuneifolia*, Gard., as the latter is in no way distinct from the former, some of the specimens in Linnæus's own herbarium having leaves the underside of which is slightly pubescent, as those of *C. cuneifolia*, Gard., are; and the difference about the fruit being spotted in the one (*C. Cujete*, Linn.), and not spotted in the other (*C. cuneifolia*, Gard.), amounts to nothing, as the spots are generally observable in young fruits, and disappear in the old ones. *C. acuminata*, H.B.K., which—misguided by the term "fragile," applied to its fruit by De Candolle, a term not

mentioned in the original description of that plant by H.B.K.,—I suggested (Bot. of H.M.S. Herald, p. 183) might belong to *C. cucurbitina*, Linn., is, according to the description in H. B. et K., Nov. Gen. et Sp., and an authentic specimen in the Royal herbarium at Berlin (full particulars of which were kindly transmitted to me by my friend Mr. F. Körnicke), also identical with *C. Cujete*, Linn.

The second *Crescentia* I consider a good species is *C. cucurbitina*, Linn., which Linnæus published in his 'Mantissa,' and which he probably never saw, as there is no specimen of it in his own herbarium; he described it, most likely, as he has done in several other instances, from Plumier's figures. This species is distinguished by its simple alternate leaves, and the shell of its fruit, which is so fragile that it may be crushed in the hand like an egg. *C. latifolia*, Lam, has always, and with justice, been looked upon as a synonym of this species; and to this I have added *C. obovata*, Benth., *C. lethifera*, Tussac, *C. toxicaria*, Tussac, and *C. palustris*, Forsyth Herb., as I cannot find any distinction between them and *C. cucurbitina*, Linn. The description of *C. ovata* in Burmann's 'Flora Indica,' p. 132, short as it is (C. foliis ovatis integerrimis, apice acuminatis; *folia* in hac specie perfecte ovata nec attenuata, ut in *C. Cujete*, L.), agrees perfectly well with this, and no other species, so that I have little hesitation in considering that also identical with *C. cucurbitina*, Linn. The third species of *Crescentia*, holding good, is *C. macrophylla*, Seem., allied to, but quite distinct from, the preceding.

The fourth *Crescentia*, the existence of which I am ready to acknowledge, is *C. alata*, H.B.K. That species is best known by having at every axil three leaves, the central one of which is trifoliolated, and by its hard-shelled fruit. As a synonym of it, I regard *C. trifolia*, Blanco; as the description of the latter in the 'Flora de Filipinas' agrees word for word with *C. alata*, H.B.K., and as its Mexican origin has been well traced by Blanco, the author of that Flora, who says, "Tal vez habran venido de America; . . . llaman en Nueva España *Tecomate*."

These are the only four species of *Crescentia* I consider as well established. *C. aculeata*, H.B.K., is but a synonym of *Parmentiera edulis*, DC.; and *C. edulis*, Desv., is merely the simple-leaved form of the same plant. It may indeed appear strange that De Candolle, so acute an observer, should have enumerated in his 'Prodromus' one and the

same plant under three different names, and under two genera. But this is easily explained, by the fact that De Candolle established *Parmentiera* solely upon a figure of Mozino and the description of Hernandez. He never saw perfect specimens of *C. aculeata*, H.B.K., nor had he a specimen of *C. edulis*, Desv., at his disposal, but merely knew the latter from the brief description given of it by Desvaux. Three other plants, formerly associated with *Crescentia*, have already been referred to their proper genera by De Candolle and others: *C. edulis*, Moz., to *Parmentiera edulis*, DC., *C. jasminoides*, Lam., to *Gardenia clusiæfolia*, Jacq., and *C. pinnata*, Jacq., to *Kigelia pinnata*, De Cand.

De Candolle has enumerated (Prod. ix. 244) only one species of *Parmentiera* (*P. edulis*, De Cand.); and I have added (Botany of H.M.S. Herald, p. 183) two more (*P. cereifera*, Seem., and *P. aculeata*, Seem.). Of the latter two, only one (*P. cereifera*, Seem.) holds good; *P. aculeata*, Seem., is, I am now convinced, identical with *P. edulis;* so that the genus consists at present of two species, both of which are very distinct from each other. *P. edulis*, De Cand., has branches furnished with thorns, occasionally simple leaves, and a tuberculate fruit. *P. cereifera*, Seem., the famous Candle-tree of the Isthmus of Panama, is quite unarmed, has always compound leaves, and bears a fruit the surface of which is quite smooth. As synonyms of it I regard, besides the *P. aculeata*, Seem., already mentioned, *Crescentia aculeata*, H.B.K., *C. edulis*, Desv., and, upon the authority of C. B. Heller (Reisen in Mexiko, p. 414), *C. musæcarpa*, Zaldivar.

De Candolle has enumerated (Prodr. ix. 247) but one species of *Kigelia*, viz. *K. pinnata*, De Cand.; adding to it, as synonyms, *Crescentia pinnata*, Jacq., *Tanæcium pinnatum*, Willd., and *Tripinnaria Africana*, Sprengl.,—an arrangement to which I fully consent. Decaisne has, since the publication of the 'Prodromus,' described as a second species *K. Æthiopica* (De Lessert's Icon. Select. Pl. vol. v. 39. t. 93 A et B); and Bentham subsequently, as a third, *K. Africana* (Hook. Niger Flora, p. 463), uniting with the latter the old *Bignonia Africana*, Lam. (Dict. vol. i. 424), which De Candolle, at p. 166 of his 'Prodromus,' enumerates amongst the doubtful *Bignonias.* A careful comparison of the various descriptions and specimens of these three supposed species has led me to the conclusion that all three are but one and the same species, the original *K. pinnata*, upon which the genus was founded. The genus *Sotor* of Fenzl (the name of which is an adoption of the

vernacular one of the plant in some parts of Nubia), established upon Kotschy's specimens (no. 403), is also a synonym of *Kigelia Africana*. It must, however, be added that Fenzl, when publishing the latter name (Vortrag über eine neue Crescentiaceen Gattung, p. 1 et 2), made a mistake in supposing that *Spathodea campanulata*, Beav. (to which Bentham refers, and I think rightly, *S. tulipifera*, Don, and *Bignonia tulipifera*, Schum. et Thonn.), is identical with his *Sotor*. The existence of *S. campanulata* is not at all doubtful, as there exist very good specimens of it in the herbaria of both Hooker and Bentham, agreeing quite well with the description and figure in Palisot's Fl. Owar., and showing that it has nothing to do with *Kigelia*.

Crescentiacearum Tribus Crescentieæ.

Calyx deciduus, irregularis, spathaceus vel bipartitus.

Genera.

1. *Parmentiera*, DC.—*Calyx* spathaceus. *Fructus* carnosus, teres, epulposus.—Folia *opposita, plerumque trifoliolata.*—America tropica.
2. *Crescentia*, Linn.—*Calyx* bilabiatus, lobis integerrimis. *Fructus* lignosus, pulposus.—Folia *sparsa vel fasciculata, simplicia vel trifoliolata.*—America tropica.
3. *Kigelia*, DC.—*Calyx* bilabiatus, lobis irregulariter fissis. *Fructus* corticatus, pulposus.—Folia *opposita, simplicia vel pinnata.*—Africa tropica.

I. Parmentiera, *DC.*

Calyx deciduus, spathaceus, longitudinaliter fissus. *Corolla* subcampanulata, tubo lato brevi, fauce hiante, limbo distincte 5-lobo, lobis subæqualibus patentibus. *Stamina* 4, didynama, cum rudimento quinti. *Antheræ* 2-loculares, loculis divergentibus. *Discus* glandulosus, ovarii basin cingens. *Stylus* elongatus. *Stigma* bilamellatum, lamellis integerrimis. *Ovarium* uniloculare, multiovulatum. *Fructus* carnosus, indehiscens, teres, tuberculatus vel lævis, spurie 2–4-locularis, epulposus. *Semina* plurima, parva, cordata vel subrotunda. *Albumen* nullum.—Arbores *Americæ tropicæ*, ramis *aculeatis vel inermibus*, foliis *oppositis, simplicibus vel trifoliolatis*, pedunculis *unifloris subcongestis ex trunco aut basi ramorum et ramulorum ortis*, corollis *albidis vel virescentibus*, fructibus *flavis.*

The genus *Parmentiera* differs from *Crescentia* and *Kigelia* in its spathaceous calyx, and its quite fleshy cylindrical fruit.

1. Parmentiera *cereifera*, Seem.; arborea, ramis inermibus, foliis omnibus trifoliolatis, foliolis ovato-ellipticis vel obovato-oblongis utrinque acuminatis serratis vel integerrimis, petiolo communi alato, corollæ albidæ lobis emarginatis, fructu terete lævi bisulcato glaberrimo.—P. cereifera, *Seem. in Bot. Herald, p.* 182. *t.* 32.—Nomen vernaculum Panamense, "Palo de Velas."

The geographical range of this remarkable plant appears to be very limited. I found it in the central parts of the Province of Panama, and no other traveller seems to have noticed it in any other country.

2. Parmentiera *edulis*, DC.; arborea, ramis aculeatis, aculeis sub foliis insertis, foliis petiolatis aliis simplicibus ovato-oblongis vel cuneato-lanceolatis aliis trifoliolatis, foliolis ovato-oblongis utrinque attenuatis integerrimis, petiolo communi superne anguste alato vel nudo, corollæ virescentis lobis undulato-crispis, fructu angulato tuberculato.—P. edulis, *DC. Prod. v.* 9. 244. P. aculeata, *Seem. Bot. Herald*, 183! Crescentia edulis, *Moz. Fl. Mex. ic. ined.* (*sec. De Cand.*) C. edulis, *Desv. Journ. Bot. v.* 4. *ann.* 1814, *p.* 112! C. aculeata, *H. B. K. Nov. Gen. Am. v.* 3. 158! C. musæcarpa, *F. Zaldivar, Flor. Mex. ined. nov. secund. Heller, Reisen in Mexiko, p.* 414.—Nomina vernacula Mexicana, "Quauxhichotl," "Quanuxilotl," "Quaxilote," et "Cuajilote."

This tree appears to be common in the Tierra Caliente of Southern Mexico. According to Hernandez, it is found in Yauhetepec; according to Desvaux, in Guaxaca; and according to Humboldt and Bonpland, in Campeche, at Gonacatepic. I myself have seen Mexican specimens in Herb. Hook. from Schiede (no. 1207) and Coulter; the latter had collected them at Zinapan.

II. Crescentia, *Linn.*

Calyx deciduus, bilabiatus, lobis integerrimis. *Corolla* subcampanulata, tubo elongato, fauce magna ventricosa, limbo inæqualiter 5-fido vel crenato aut fimbriato-laciniato. *Stamina* 4, cum rudimento quinti. *Antheræ* biloculares, loculis divergentibus. *Discus* glandulosus, ovarii basin cingens. *Stylus* elongatus. *Stigma* bilamellatum. *Ovarium* uniloculare, multiovulatum. *Fructus* globosus, ovatus, vel ellipsoideus, cortice lignoso, intus pulposus. *Semina* plurima. *Albumen* nullum. *Embryo* magnus.—Arbores *vel* frutices *arborescentes Ame-*

ricæ tropicæ, foliis *alternis solitariis vel fasciculatis, simplicibus vel trifoliolatis*, pedunculis *e trunco ramisve ortis*, corollis *rubentibus virescentibus, vel virescentibus purpureo et flavo variegatis.*

Crescentia differs from *Parmentiera* in its bilabiate calyx and pulpy fruit; from *Kigelia* in its hard-shelled (woody) fruit.

§ 1. *Folia alterna, solitaria. Corolla virescens.*

1. Crescentia *cucurbitina*, Linn.; arborescens, foliis alternis solitariis omnibus simplicibus lanceolato-ovatis vel obovatis breviter acuminatis, fructibus globosis ovatis vel ellipticis, cortice fragili.—C. cucurbitina, *Linn. Mant. p.* 250; *Swartz, Obs. p.* 234! C. latifolia, *Lam. Dict. v.* 1. *p.* 558!; *Pluk. Alm. t.* 171. *fig.* 2; *Plum. et Burm. t.* 109. *fig. sup.!* C. obovata, *Benth. Bot. Sulph. p.* 130. *t.* 46! C. ovata, *Burm. Fl. Ind. p.* 132! C. lethifera, *Tussac, Fl. des Antill. v.* 4. *p.* 50. *t.* 17! C. toxicaria, *Tussac, Fl. des Antill. v.* 4. *t.* 17. C. palustris, *Forsyth, Herb.!*—Nomen vernaculum Panamense, "Calabazo de Playa."

A shrub, about 15 feet high, growing commonly on the coast of the islands and the continent of the central parts of America, and probably only cultivated in Java. I have seen specimens of it from Jamaica (W. Wright! Purdie! Distin!), St. Vincent (Anderson!), Chagres (Fendler, no. 120!), Pacific coast of the Isthmus of Panama (Seemann!), Island of Gorgona (Barclay!). Tussac ascribes to it poisonous qualities; but the statement that it has proved injurious to people who came in contact with it must be received with caution; as it stands quite isolated, and as no poisonous qualities are known to exist in the whole series of plants to which the *Crescentiaceæ* belong, I am inclined to dismiss it altogether as unworthy of credit, and feel almost disposed to think that the Manzanilla-tree, which, growing generally in company with *C. cucurbitina*, may have caused the mischief, if any was caused.

2. Crescentia *macrophylla*, Seem.; arborescens (vel arborea?), glaberrima, foliis alternis solitariis omnibus simplicibus obovato-lanceolatis breviter acuminatis versus basin longe cuneatis integerrimis, nervo (unico) utrinque acuto, petiolis basi valde incrassatis, corolla (virescente) campanulata, tubo elongato curvato ventricoso, limbo subregulari fimbriato-laciniato, lamellis stigmatis fimbriatis, fructus . . .—C. macrophylla, *Hort. Kew.*

The largest of the plants (cultivated in the Royal Botanic Gardens at Kew) from which the present description is taken, is about 7 feet high, making it probable that this species attains the size of a tree. Petioles and young branches purple. Largest leaves about 15 inches long, and in the broadest part from 2 to 3 inches broad; peduncles 1½ inch long; calyx 1 inch long; corolla and calyx furnished with glandular dots; style and stamens as long as the corolla; ovary unilocular.

This species is easily distinguished from *C. cucurbitina* by its incrassate petioles and peculiarly-shaped leaves; the limb of the corolla probably varies like that of *C. cucurbitina*, where it is sometimes distinctly five-lobed, and sometimes crenato-dentate or fimbriated. The native country of *C. macrophylla* is still unknown, but, judging from the habit of the plant, I think it must be Tropical America.

§ 2. *Folia fasciculata. Corolla rubescens vel virescens purpureo et flavo variegata.*

3. Crescentia *Cujete*, Linn.; arborea, foliis fasciculatis ex axilla 5 omnibus simplicibus lanceolato-obovatis breviter acuminatis versus basin longe cuneatis, supra glabris nitidis, subtus puberulis glabrisve, fructibus plerumque globosis, cortice lignoso duro.—C. Cujete, *Linn. Sp. p.* 872; *Swartz, Obs. p.* 234; *Lam. Dict. v.* 1. *p.* 557; *Jacq. Amer. p.* 175. *t.* 111. *Hook. Bot. Mag. t.* 3430. *Vell. Fl. Flum. v.* 6. *t.* 103; *Plum. et Burm. t.* 109, *fig. infer. Comm. Hort. v.* 1. *t.* 71! C. cuneifolia, *Gard. in Hook. Journ. of Bot. v.* 2. *p.* 422! C. acuminata, *H. B. K., Nov. Gen. Amer. v.* 3. *p.* 157!—Nomina vernacula Americana, "Tutumo," "Turtumo," "Palo de Tutuma," "Palo de Turtuma," "Calabazo," "Calabash-tree."

A tree, about 30 feet high, growing wild in woods, but very generally cultivated in tropical America, in gardens, and around human habitations, in open exposed situations. I have seen specimens of it from Jamaica (P. Browne in Herb. Linn. prop.! W. Wright!), Cuba (Humboldt et Bonpland!), Santa Lucia (Herb. Mus. Brit.!), Guiana (Aublet!), Brazil (Blanchet!), Isthmus of Panama (Seemann!).

4. Crescentia *alata*, H. B. K.; arborea, foliis fasciculatis ex axilla 3, medio longe petiolato trifoliolato, lateralibus simplicibus minoribus sessilibus, petiolo foliolorum trifoliolatorum late alato, fructibus globosis, cortice lignoso duro.—C. alata, *H. B. K. Nov. Gen. Amer.*

v. 3. *p.* 158. C. trifolia, *Blanco, Fl. de Filipinas, p.* 489!—Nomina vernacula, in Mexico, "Guautecomate," "Tecomate," et "Quiro;" in Ins. Philip., "Hoja cruz."

A tree, about 30 feet high, resembling in general aspect *C. Cujete*, and growing commonly on the western coast of Mexico, from Acapulco to Mazatlan, where I have repeatedly met with it, and where Gregg (no. 944), as well as Humboldt and Bonpland, also found it. According to Blanco, it is cultivated in the Philippine Islands, where, from the resemblance of the central leaf to a cross, it is vernacularly termed "Hoja cruz." I observed it in the gardens of the town of David, Veraguas. It will probably never be cultivated to any great extent, as its fruit is scarcely ever larger than a good-sized orange, and consequently too small for making from its shell, as of that of *C. Cujete*, pails and other large vessels. I must not omit however to mention that I have seen cups, made from the shells of this species, in the markets of Mazatlan. The chief use the Mexicans make of the fruit, is to boil the pulp with sugar, and administer it internally to those suffering from complaints of the chest (consumption?). The inhabitants of the Philippine Islands consider, according to Blanco, a decoction of the leaves an effectual remedy for hæmoptysis.

III. Kigelia, *De Cand.*

Calyx deciduus, tubuloso-subcampanulatus, bilabiatus, labiis irregulariter fissis et hinc calycem spurie 5-fidum constituentibus. *Corolla* resupinata, tubo brevi, fauce lata campanulata, limbo subæqualiter 5-lobo, lobis ovatis acuminatis. *Stamina* 4, didynama, cum quinto sterili. *Antheræ* biloculares, loculis basi longe discretis. *Discus* glandulosus, ovarii basin cingens. *Stylus* staminum fere longitudine. *Stigma* bilamellatum. *Ovarium* uniloculare, glabrum, placentis parietalibus. *Bacca* ellipsoidea vel lineari-oblonga, cortice corticato, intus pulposa, spurie bilocularis. *Semina* in pulpa nidulantia, subrotunda vel obovoidea, testa fuscescente. *Albumen* nullum. *Cotyledones* rotundatæ, externe longitudinaliter plicatæ, segregatæ (ex De Cand.).—Arbor *Africæ tropicæ;* ramis *divergentibus, cortice albido;* foliis *oppositis simplicibus (in plantis junioribus) vel pari- vel impari-pinnatis;* foliolis (5–11) *ellipticis vel ovato-ellipticis, non raro inæqualibus, terminali obovato, integerrimis vel subrepando-dentatis, coriaceis, utrinque glaberrimis;* paniculis *longissime pedunculatis, pendentibus, e trunco*

seu ramis vetustis ortis; corollis *amplis atro-rubris extus pallidioribus;* baccis *pendulis* (2 *ped. long.*, 5 *unc. lat.*), *albidis.*

The genus *Kigelia* approaches closely to *Crescentia*, from which it differs in having opposite pinnated leaves, a calyx, the lobes of which split irregularly, a resupinate corolla, and a corticate, not a woody fruit.

1. Kigelia *pinnata*, De Cand., *Prodr. v.* 9. *p.* 247! Crescentia pinnata, *Jacq. Coll. v.* 3. *p.* 203. *t.* 18. *ic. flor.*! Tanæcium pinnatum, *Willd. Sp. v.* 3. *p.* 312! Bignonia Africana, *Lam. Dict. v.* 1. *p.* 424! Kigelia Africana, *Benth. in Hook. Niger Fl. p.* 463! Tripinnaria Africana, *Sprengl. Syst. v.* 2. *p.* 840! Kigelia Æthiopica, *Dcne. in De Lessert, Icon. select. Pl.* v. *p.* 39. *t.* 93 *A et B!* Sotor, *Fenzl, Vortrag über eine Crescent.-Gattung.*—Nomina vernacula, in Nubia, Sotor (Fenzl!), et ad "Great Lake," Maporotla (Oswald!).

Kigelia pinnata enjoys a very wide geographical distribution, being found both on the east and the west coast of Africa, and stretching probably quite across that continent, the coast regions of which it has been proved to inhabit. It has been collected in Nubia (Kotschy, no. 403! Sabatier!), in Mozambique, at Port Natal (Garden!), in Senegal, at Cape Coast Castle (Th. Vogel!), on the river Zongha, latitude 21° S. (Oswald!), and at the Great Lake of Southern Africa (according to specimens in the Kew Museum, communicated by Colonel Steel and Miss Gurney). It is also cultivated in the Botanic Garden at Mauritius (Bojer!), and in that at Kew. It used to be in the latter institution many years ago, according to a specimen of Aiton, in Herb. Hook.; but was again lost, until it was re-introduced in 1854, by Captain Garden, from Port Natal.

According to Oswald, it is called "Maporotla" on the banks of the river Zongha, and its wood is there used principally for canoes.

Extract of a letter from C. J. Muller, Esq., *dated* Patna, October 28, 1853, *relating to preparations from* Cannabis sativa *in India; addressed to* Dr. Hooker.

In India two varieties of intoxicating drug, prepared from the Hemp-plant, are known in the bazars,—one called *Ganja*, the other *Bhang*. In this part of India the *Ganja* is procured from the district of Rajshahye

(north of Calcutta); *Bhang* comes chiefly from the districts of Tirhoot, Sarun, and Goruckpoor. In external appearance they differ considerably. *Ganja* is in the form of stalks, three or four feet long, with the inflorescence attached, the whole having been dried and pressed flat; the colour a dirty brown, odour strongly aromatic and heavy, very resinous to the touch. This variety is highly intoxicating, which is accounted for by the abundance of resin (the *churrus* of Nepal and other parts). Its retail price, deprived of stalks, is at the rate of about Rs. 200 per maund (80 lbs. avoirdupois), this high price being due to the weight of the tax imposed upon it by Government. *Bhang* is in the form of dried leaves without stalks, or at least with only fragments of stalks, and abounds in the dried inflorescence, apparently female. Its colour is a dull green; it has not much odour, and is greatly deficient in resinous matter; its intoxicating properties are very slight.

Ganja is smoked somewhat in the same way as tobacco; its continued use invariably brings on severe asthma. *Bhang* is not smoked, but is ground up with water into a pulp, and mixed with other ingredients, so as to make a thick drink, called *Subzee*, reputed to be cooling, and highly conducive to health; people accustomed to use it enjoy excellent health, in fact never get sick.

Now it has always been a question with me whether the plants yielding *Ganja* and *Bhang* are identical; see O'Shaughnessy's 'Dispensatory,' etc. The natives say that *Ganja*, like the Rajshahye drug, cannot be manufactured here nor in any of the neighbouring districts. *Bhang* grows in abundance, and is absolutely wild in the Bhagulpoor and Tirhoot districts, springing up everywhere in the former like a weed. With the view of inquiring into the matter, I have raised several *Bhang* plants in my garden this year; they are now coming into flower. The plants which have completely flowered are, with the exception of one, to all intents and purposes, monœcious, while all the botanical books I have access to, make *Cannabis* strictly diœcious. The single plant, which appears to bear only female flowers, is not completely in flower yet. The male flowers come last, and may yet appear, or I may have overlooked them. You will be interested, I think, in examining the inflorescence, and therefore I enclose some specimens. [They appear to be true *Cannabis sativa*.—Ed.] It is requisite to ascertain whether the Rajshahye plant presents the same character, and I have therefore sent to Rajshahye for specimens.

You will pereeive that this subject is curious, as bearing upon the alleged fertilization of female flowers of the diœcious class, in the absence of the male plant; for example, *Cœlebogyne*, *Lychnis dioica*, etc. If diœcious plants have a tendency, under certain circumstances of soil and climate, to become monœcious, the anomaly of fertilization in the absence of the male plant, is in a great measure removed. This remark rests however on the assumption that *Cannabis Indica*, *sativa*, *Ganja*, and *Bhang*, are all identical, a point I think yet extremely doubtful; though I can scarcely make up my mind to believe that Roxburgh, Ainslie, Wight, Griffith, and Royle, could have failed to ascertain this, if there had been any specific difference.

The female flowers greatly predominate in the specimens under my observation. The anthers in the male flower are often less than five, but are fully charged with pollen.—Believe me, etc. etc.,

C. J. MULLER.

BOTANICAL INFORMATION.

Oxford Herbarium.

(*Continued from p.* 252.)

9. FIELDING HERBARIUM.

EUROPEAN PLANTS.

N.B. The letter *P.* affixed denotes that the Collection formed a part of Mr. Prescott's Herbarium.

	Collected by	
Norway.	Kurr & Hübner.	
Russia, around St. Petersburg. *P.*	Prescott.	Flora Petropolitana, in separate portfolios, complete.
Switzerland. *P.*	Schleicher.	
Piedmont. *P.*	Hoppe.	
Pyrénées.	Endress.	Employed by the Unio Itineraria of Würtemberg as a collector during two seasons in the Pyrénées.
Spain; about Madrid and in Granada.	Boissier.	The author of the splendid work on Spanish Botany.

	Collected by	
Spain, North-west.	Durieu.	A half-pay officer in the French army. His collection consisted of about 300 or 400 species, of which probably 50 are new.
Sardinia.	Müller.	A diligent agent of the Unio Itineraria.
Dalmatia. *P.*	Lang.	
Hungary.	Heuffel.	
Rumelia.	Frivaldsky.	
South of France.	Bentham.	See his Catalogue of the Plants of the Pyrénées.
Great Britain and Ireland.	Fielding.	
France, Germany, Italy, and Portugal.	Various persons.	
Ukraine:—		
Flora of Elizabethgrad.	Boshniak.	
of Catherinenstadt. *P.*	Haufit.	
Greece and its Islands.	Aucher-Eloy.	This ardent Botanist, a native of Blois in France, abandoned his trade as a printer and bookseller, for the sake of investigating the vegetable productions of the East. He devoted eight years of his life to this undertaking, till death, the result of fatigue, closed his labours. With very limited means, this Naturalist explored many parts of Turkey, Greece, Egypt, Syria, and Persia. Mr. Fielding obtained nearly 3000 plants from this collection. See Journ. of Botany, vol. iii.

ASIA.—*Collection very rich.*

RUSSIAN TERRITORIES—		
Odessa and Tauria. *P.*	Compère, Bieberstein, Steven.	
Caucasus. *P.*	Wilhelms, Hohenacker[1], Hoffs, etc.	Very complete.

[1] Of Esslingen, near Stutgard.

	Collected by	
Northern Persia. *P.*	Meyer & Szowitz, Hausen, Gmelin, Jun.	
Altai Mts. Nearly perfect. *P.*	Ledebour[2], Meyer, Yebler, Bunge[3], Fischer.	[2] Author of the Flora Altaica. [3] Professor at Dorpat.
Plants from Kamtchatka. *P.*	Mertens, Fischer, Kastatsky, etc.	
Siberia. *P.*	Turczaninoff, Vladzimirtsky.	
China. *P.*	Prof. Bunge[4], and Fortune.	[4] Collected during the mission to Pekin.
China, near Macao.	Rev. J. Vachell.	Chaplain to the Factory at Macao.
Syria, Palestine, Arabia, chiefly from Mount Sinai and Mecca.	Schimper[5], and others.	[5] In the employ of the Unio Itineraria.
Syria, Valley of Fatma.	Fischer.	Collected by a person in the employ of the Viceroy of Egypt.
Smyrna.	Aucher-Eloy.	
Persia, Mesopotamia. *P.*	Aucher-Eloy[6], Schimper, Szowitz.	[6] About 2700 species.
Mount Taurus and Aleppo.	Kotschy.	
Turcomania. *P.*	Kardin, etc.	
East Indies.	Dr. Wallich[7], Mr. Law[8], Dr. Wight.	[7] About 3000 species. [8] Sent to Mr. Lambert, and purchased by Mr. Fielding at his sale.
Simla, in the Himalayan Mts., and Bolam Pass.	Lieut. Simpson.	About 500 rare and valuable species.
Ceylon.	Col. Walker.	
Java.	Unknown.	
Philippine Islands.	Cuming.	A most complete collection of about 2500 species.

AFRICA.

Cape of Good Hope.	Drege[1], Ecklon & Zeyher.	[1] A complete set of his very extensive collection in the Colony. See Comp. to the Bot. Mag., vol. ii.
Port Natal.	Krauss.	350 species.

	Collected by	
Mauritius. *P.*	Sieber, Telfair.	
Bourbon.	Unknown collector.	Some beautiful Ferns, and several highly curious Orchideæ.
Senegambia.	Hudelot.	About 500 species, many new or rare.
St. Helena.	Cuming.	
Madeira.	Lippold.	
Azores.	Guthnick.	
Algeria.	Bové.	Author of the Flora of Algeria.
Egypt and Abyssinia.	Schimper.	Who obtained a high post under the Government of that country.
Nubia and Ethiopia.	Kotschy.	

NORTH AMERICA.

Arctic regions, Rocky Mountains, and Texas.	Drummond.	Nearly complete sets of the plants collected by this ardent Botanist.
Columbia and California.	Douglas.	The unfortunate Naturalist who lost his life by falling into a pit in one of the Sandwich Islands, in which a wild bull had been entrapped.
United States. *P.*	Nuttall[1], about 2000 species; Torrey and Gray[2]; Frank, Freedley, Rugel, Short[3], etc.	[1] Sometime Professor of Botany at Cambridge, Mass. [2] Authors of the excellent Flora of North America. [3] An excellent Botanist of Louisville, Kentucky.
Canada. *P.*	Gouldie.	
Mexico and Guatemala.	Hartweg[4], Schiede and Deppe, Berlandier, Parkinson, Galeotti, Andrieux, Mocino and Sesse.	[4] Sent out as collector by the Horticultural Society.
West Indies, chiefly St. Domingo. *P.*	Sieber, Guilding, and Doustan.	
Trinidad, Cuba, Martinique.		But in this region the Collection is very defective.

SOUTH AMERICA.—*Very rich.*

	Collected by	
From various parts.	Blanchet, Claussen[1], and Lushnath.	[1] 300 species from the Province of Minas Geraes.
Guiana.	Sir R. Schomburgk.	The introducer of the Victoria Water-Lily.
Surinam.	Hostmann[3].	[3] See the account of his perilous journey in the Lond. Journ. of Botany, vol. i.
Caraccas. *P.*	K. Porter, Linden.	
Buenos Ayres, Rio, and South Brazil.	Tweedie.	Many new species.
Brazils:—Rio, Organ Mountains, and Pernambuco.	Gardner: 4000 species.	Coadjutor to Mr. Fielding in the publication of the 'Sertum Plant.' and afterwards Director of the Bot. Gard. Ceylon.
Columbia and Loxa.	Hartweg.	About 250 most exquisite specimens.
Peru.	Mathews[4], Pöppig (Author of Travels in Chili, etc.).	[4] More than 2000 species, being the set reserved for himself.
Chili. *P.*	Pöppig, Cuming, Bridges, Gillies[5].	[5] The Herbarium of Dr. Gillies had just come into Lambert's hands, when on his death it was sold to Mr. Fielding.
Amazon river.	Pöppig, King, Ruiz and Pavon[6].	[6] No. 101 of Lambert's sale.
Amazon region.	Spruce.	Now (1853) engaged as a collector in this region.
Bolivia.	Pentland & Kelly.	

NEW HOLLAND.

From various parts.	Sieber, Allan Cunningham[1], Anderson, Caley, Frazer.	[1] The two brothers Richard and Allan Cunningham were both in succession appointed Colonial Botanists at Sydney, and made great additions to the plants imported into England from that continent.

	Collected by	
Swan River.	Drummond.	About 1200 species.
Van Diemen's Land.	Gunn.	An extensive and valuable collection.
New Zealand.	Richard Cunningham[2], Bennett, and Edgerley.	[2] Small, but interesting collection.
Sandwich Islands.	Douglas.	Collected just before his death.
Sydney and King George's Sound.	Cunningham.	
Port Jackson.	Anderson.	About 500 species.

Alexander Croall's PLANTS OF BRAEMAR; *being Dried Specimens of the Plants Illustrative of the Flora of Braemar, N. B.*

Mr. Croall, of Montrose, having last year, as stated in our Journal, accomplished a botanical tour in the Mountains of Clova, a few friends (who contributed to the expenses of that visit) were so gratified with its results, from the rarity, beauty, and correct nomenclature of the specimens, especially of the Cryptogamous plants, that they have recommended him to spend a portion of the present and following summers entirely among the mountains of Braemar, Ben-vrotan, Loch-nagar, Ben-na-mac-dhui, Ben-na-bourd, etc. This country, already so interesting from the richness of its alpine vegetation, becomes doubly so, as including the loftiest group of mountains in Scotland.

The collections will be prepared for sale in small folio Fascicles, entitled 'Plants of Braemar,' each containing a century of species, carefully dried, and named, in English and Latin, with the localities indcated, and neatly attached on good white separate leaves of paper, at the price of Thirty Shillings. Two, or perhaps three such fascicles, or centuries, will be ready during the present year (1854), and Mr. Croall expects to complete the work in five Fascicles, during the following year (1855). The specimens will be all numbered, for the facility of future reference.

Subscribers' names will be received by Mr. A. Croall, Castle-street, Montrose; and Sir W. J. Hooker, K.H., Royal Gardens, Kew, will be happy to forward the names of any subscribers that may be communicated to him.

LICHENS *of the late* PASTOR SCHÆRER.

M. Guthnick, Director of the Botanic Garden at Berne, has written to inform me that the private collection of Lichens, belonging to the late Pastor Schærer, has been sold to M. E. Boissier of Geneva.

He states that there still remain for sale the collections which served as the basis of Schærer's 'Lichenes Helvetici Exsiccati,' amounting to 650 species or varieties, of each one of which, with the exception of a few, there are from ten to fifty specimens.

This rich collection has been valued by Mr. Shuttleworth and himself at 1500 French francs, which he considers "*beaucoup au dessous de leur valeur*," and at which sum he offers it for sale, with the probability of some small abatement from the price. He is desirous that a number of British botanists should join together to purchase, and is open to offers.

M. Guthnick also states that he can supply Schærer's Lich. Helv. Exsic., 13 volumes, at 12 French francs per volume.

W. A. LEIGHTON.

NOTICES OF BOOKS.

United States Exploring Expedition. BOTANY. Phanerogamia; *by* DR. ASA GRAY, M.D., *with a Folio Atlas of* 100 *plates.* Vol. I. Large 4to. New York. 1854.

Such is the title of the first volume, long anxiously expected, of the Botany of the United States Exploring Expedition, during the years 1838–1842, under the command of Captain Charles Wilks, U.S.N. In our second volume of this Journal, p. 383, we mentioned that Dr. Asa Gray, the distinguished Professor of Botany at Harvard University, U.S.A., was then (1852) on a visit to Europe, for the purpose of inspecting the various Herbaria which might assist him in so important an undertaking: and well did he employ his time in that investigation. The volume of text now before us (for the plates are not yet published) commences without introduction or preface, and terminates with the *Araliaceæ*, following the arrangement of De Candolle. We may form, however, some idea of the importance of this work when completed, by

referring to an article in Silliman's American Journal of Science (vol. xliv. 1843, p. 405), where it is announced.

"Ten thousand species of plants, and upwards of 50,000 specimens, constitute the Herbarium of this Expedition. The following catalogue gives the number of species collected at the several places visited:—

Madeira	300	Fejee Islands	786
Cape Verds	60	Coral Islands	29
Brazil	980	Sandwich Islands	883
Rio Negro (Patagonia)	150	Oregon	1218
Tierra del Fuego	220	California	519
Chili	442	Manilla	381
Peru	820	Singapore	80
Tahiti	288	Mindanao	102
Samoa (Navigators' Islands)	457	Sooloo Islands	58
New South Wales	787	Mangsi Islands	80
New Zealand	398	Cape of Good Hope	300
Auckland Islands	50	St. Helena	20
Tongatabu	236		
			9646

"Including the Mosses, Lichens, and Seaweeds, the number will exceed 10,000. There are coloured drawings of 180 species of plants, beautifully executed."

Of the above list, however, be it observed, the Oregon and Californian species (estimated at 2107 species), will be incorporated with the 'North American Flora' of Messrs Torrey and Gray, and excluded from this work; and of the remaining countries, it is only the Samoa, or Navigators' Islands, the Feejee and Sandwich Islands (these especially), and the Mindanao, Sooloo, and Mangsi Islands, that can be expected to afford much of novelty: the vegetation of other places visited has been pretty well exhausted by previous navigators. The several species of those countries, and the known ones of all, are in this work merely named, unless any new information is elicited by their examination; and the whole is systematically arranged as an entire Flora of the voyage, not divided according to countries. Of the new genera and new species, the characters are given in Latin, accompanied by further descriptive and other remarks in English. Some idea of the relative importance of the collections made in the Feejee and Sandwich Islands may be conceived, from the fact that of the 100 plates to be devoted

to this volume, 45 will represent plants of the former, and 35 of the latter group, or, combined, eight-tenths of the 100.

Like everything from the pen of Dr. Asa Gray, his genera and species are worked out with great care and precision, and he often amends the characters or corrects the errors of others, with much judgment. Not exactly so, however, in the case of the *quæstio vexata* of the genus of *Myrtus Ugni* of Molina (genus *Ugni*, Turcz., *Eugenia*, Hook. et Arn.), where, referring to our Bot. Misc. vol. iii. p. 348, he says, "Through some mistake, the flowers are said to be quadrifid, and the peduncles shorter than the leaf." It so happens that a living specimen of this very species is before us, while reading this note of our friend, and it has the flowers quadrifid (*i. e.* tetramerous), and the peduncle shorter than the leaf. It is nevertheless true that they are not always so.

Some of the unpublished plates are in our possession; and we can truly say, this fine work promises to be as honourable to the American Government and the country, as it is to the able author.

DOZY, F., *et* J. H. MOLKENBOER: BRYOLOGIA JAVANICA; *seu Descriptio Muscorum Frondosorum Archipelagi Indici Iconibus illustrata. Fasciculus* 1, *cum tabulis* 5. 4to. Leyden, 1854.

Messrs. F. Dozy and J. H. Molkenboer are already favourably known in the botanical world by their 'Musci Frondosi inediti Archip. Ind.,' etc., which is now concluded in six livraisons, quarto, with sixty plates. The present publication is to take its place, illustrated with figures, of which it is not too much to say that they are admirably executed, on the model of those of Bruch and Schimper's 'Bryologia Europæa,' and of Mr. Sullivant's American Mosses; and these are, we believe, drawn and lithographed with the author's own hands, thus ensuring a degree of accuracy which could not otherwise be looked for, especially in the analysis and microscopic details. The five plates of the first number are devoted to the illustration of six species of, it must be acknowledged, a very difficult and, as now considered, extensive genus, *Fissidens*, most satisfactorily figured and accompanied by full specific characters, generally some ten lines (of a quarto page) long, and equally careful descriptions and references to the plates; and three other species are described, but not figured. But this, we hold, is not enough. In the

present day, when it is too much the fashion to increase the amount of species, by making the smallest variation from the typical form characteristic of a new and distinct kind, the author should, under such circumstances, give a diagnosis, and state where the differences lie, which justify the separation, and direct the attention of the student to them. We believe, if this were more frequently the case, many an author would see the insufficiency of the grounds on which he has rested the specific distinction; at any rate he would enable others to do so: for in these cases every man must exercise his own judgment as to the validity or otherwise of a new species. The following are announced as the conditions under which the work will be published:—

"1. L'ouvrage paraîtra en livraisons, contenant cinq planches accompagnées de description. La livraison ci-jointe sert de modèle.

"2. Nous publierons dans le courant d'une année cinq livraisons, qui formeront un volume.

"3. Le prix de chaque volume de cinq livraisons est fixé à *dix florins* de Hollande, payables à la réception de la cinquième livraison de chaque volume.

"4. Dans la publication les auteurs suivront, autant que possible, l'ordre systématique. L'éditeur se réserve néanmoins le droit d'expédier aux souscripteurs deux livraisons à la fois.

"5. Les planches des espèces, déjà publiées dans notre ouvrage 'Musci Frondosi inediti Archip. Ind.' etc. (Lugd. Bat. apud Hazenberg, jun.), qui est maintenant terminé en 6 livraisons, ne seront pas reproduites. Néanmoins on trouvera dans le présent ouvrage la description de ces espèces.

"6. Les souscripteurs, qui désireraient posséder des échantillons, sont invités de se déclarer dans leur bulletin de souscription. Ils les recevront dans ce cas *gratis*, suivant l'ordre de souscription et autant que le nombre des doubles le permettra. Nous inviterons les botanistes de nous procurer réciproquement des échantillons d'espèces qui nous manquent. D'abord nous indiquons les *Fissidens Braunii* et *serratus*.

"7. Une liste des noms de ceux qui voudront bien honorer notre entreprise de leur souscription, sera jointe au premier volume. Chaque année nous publierons un supplément.

"8. On souscrit par la signature et l'expédition du présent bulletin."

On some Species of AMOMUM, *collected in* WESTERN TROPICAL AFRICA *by* Dr. Daniell, Staff Surgeon, etc. etc; by J. D. HOOKER, M.D., F.R.S.

For the materials from which the following identifications and descriptions are made, I am indebted to the kindness of Dr. Daniell, who, at my request, exerted himself to procure, for the Museum at Kew, specimens in all states, of the various species of *Amomum* which he was able to obtain in those parts of Africa which he visited. These, consisting of dried leaves and fruits, and of flowers preserved in spirits, of all; and of whole dried specimens of stems and rhizomes, with leaves and fruit attached, of many, afford the most extensive and complete illustration of the African species that exists in this country; and, being accompanied by observations on the commercial and medical value of their produce, they are of the greatest interest both to the Botanist and Pharmacist.

Hitherto the materials at the disposal of botanists for identifying the species of *Amomum*, described by Linnæus, Afzelius, Smith, Roscoe and Pereira, have for the most part been wholly insufficient: characters of no botanical value have (in the absence of better) been employed to distinguish plants that did not differ specifically, and dissimilar species have been united. Thus in Rees's Cyclopædia, which contains the fullest botanical account of this genus, the *A. Granum-Paradisi* of Smith appears under three names; and in the late Dr. Pereira's 'Materia Medica,' which contains the best modern account of these drugs and their origin, it is stated that some doubt still exists whether the two most dissimilar species, *A. Granum-Paradisi* and *A. Melegueta*, are identical or distinct. Much of this confusion has arisen from the fact, that the descriptions hitherto published are very incomplete; but more is owing to the undue value attached by pharmacists, who are not skilled in botany, to characters of apparent but of no real value, and to their non-appreciation of important ones that are often conspicuous, but not understood.

Thus, the scape being single-flowered is, in the present state of our knowledge of the genus, of itself a sufficient diagnosis of the *A. Melegueta*, Roscoe; as is the presence of minute hairs on the bracts, perianth, and fruit, of the *A. Granum-Paradisi* of Smith.

Absolute size, whether of the whole plants of *Amoma*, or of their

leaves, flowers, and fruits, affords no character whatever: this fact I was familiar with, from having observed what occurs in India in the congeners of the African species, and in allied plants; and I was very glad to have my opinion confirmed by Dr. Daniell, who informs me that there are no limits to the variations in stature and luxuriance of the species. Generally speaking, the specimens from southern localities and from the hills are much the smallest; but the size of the largest fruit varies in individual specimens, to twice and even thrice that of the smallest; their shape varies also greatly, but within certain limits. Generally speaking, the form of the spathaceous calyx and of the segments of the perianth is tolerably constant; but the processes at the base of the filaments vary considerably, as does the expanded top of the anthers, which, in different specimens of *A. Granum-Paradisi*, is either lobed or notched, or entire or bifid. The foliage affords better characters than is generally supposed, there being great and constant differences in the length of the narrowed base of the blade, and its equal or unequal sides, whilst the cordate base of the leaves of *A. longiscapum* is a very striking character.

Immature seeds are often pale and silvery, or lead-brown, while the old ones are plump and shining. The seeds of all are tolerably constant in form and surface, but not in colour, nor in the size or prominence of the usually projecting parts surrounding the micropyle. How far the taste of the seeds affords in all cases a trustworthy character, admits of doubt. I can perceive very marked but unimportant differences in the amount of aroma and of pungency in the seeds of *A. Melegueta*, but it is not possible to say whether these differences arise from the flavour having never been developed, or from its being lost by bad drying, or by exposure or moisture. Every one accustomed to test the aroma and taste of wild or cultivated plants in their living state, is aware how variable all species are in these respects, and that this is not the exception, but the rule; it is so with the cultivated Nutmeg, Ginger, Clove, Cardamom, Tobacco, etc. etc.; and to an equal or greater degree with the wild *Umbelliferæ* and *Compositæ* that yield resinous and aromatic secretions; and it is to be remarked that not only do individual species vary in different localities, but that the same individual is dependent on the distribution of heat, cold, and moisture, in all its annually varying relative proportions. This fact cannot be too strongly pressed upon the attention of the pharmacist at home, who is apt to

suppose, because the samples which have been imported for centuries have all the same sensible properties, that therefore the species that produce them do not vary in these respects.

There is another risk to which the medical botanist is often exposed, in his attempts to identify his imperfect specimens of drugs with the imperfect descriptions of authors, which is, the too great confidence placed in the absolute value of taste. I do not allude to its relative value amongst different samples of drugs of one kind, but to the comparison of the tastes of these and of novel ones with other objects. Thus I find the seeds of one species of *Amomum* (still unrecognized by pharmacists and botanists) described as having the flavour of lemons: I am far from saying that this is not correct, but I have so often seen two or more persons give such widely different comparisons for the taste of a novel substance, that I should myself place little confidence in one individual's opinion upon a subject of this kind.

With regard to the correct reference of the detached leaves, flowers, and fruits of the plants described below, to the different species to which they belong, I am, as indicated above, wholly indebted to Dr. Daniell. I have no reason to suppose any mistake to have occurred in the ticketing or collecting; but, as such often do occur, and as I have made such myself in tropical jungles, even when most sedulously endeavouring to avoid the possibility of errors, I cannot attach implicit faith to these. In almost all cases there is sufficient botanical evidence that the flowers in spirits are certainly those of the specimens with fruit and leaves attached, as in the case of *A. Melegueta*, *A. Granum-Paradisi*, and *A. Danielli*; but there is not such good evidence that the flowers of *A. longiscapum* and *A. cereum* belong to the leaves and fruits included in the descriptions of them: I have no reason, however, to doubt that they do. In these cases it is to be understood, that if an error has occurred, and fragments of two species have been described under one specific name, that name should be continued to the plant which bears the character suggested by the specific name, or, if the name be of indefinite signification, it should be given to the flowering specimen in preference, for in *Amomum* the flower affords the best specific character.

With regard to the specific names retained here, some would perhaps have preferred that the name *A. Granum-Paradisi* should be suppressed, or transferred to the *A. Melegueta*, which alone bears the seeds now

most valued in the market, and which in so far may be regarded as the true *Grains of Paradise.* I can, however, by no means admit of such a change, because both to Linnæus and Sir J. Smith especially, who have described the *A. Granum-Paradisi,* all the species imported with any aroma or pungency were "grains of Paradise" of the market, and were not distinguished so nicely as they now are; so too, all are *Meleguetas* (the name adopted by Roscoe for the true Grains of Paradise), as well as when he wrote; the names were therefore unexceptionable, and the descriptions and plates of these authors being admirable, both of flowers and leaves, their names must be retained. To me it appears preferable that pharmacists should systematize their fluctuating nomenclature; for there are amongst Botanists established laws for precedence in nomenclature, of which all acknowledge the force, whereas there are none for the nomenclature of drugs, any more than there are for the formulæ adopted by the various colleges in this country or on the Continent.

This leads me to another remark, which I would make with the greatest deference to the knowledge and attainments of Pharmacists, which is, that there is often too much anxiety displayed by them to obtain specific names to imperfect fragments of commercially valuable plants; especially to the fruits, seeds, roots, or leaves, which, botanically, can never be identified. This practice has in a great degree tended to complicate Medical Botany. Systematic Botany has now become so vast and so difficult a science, that it requires the undivided attention of an individual to prosecute it satisfactorily; and the same is still more the case with Pharmacy, in all its branches. I have no hesitation in saying, that I know of no Botanist whose opinion on the medical or economic value of a drug is worthy of any confidence, as compared with that of an accomplished and experienced Pharmacist; and it is not unreasonable to suppose that the converse is equally true. The botanical value of characters afforded by the organs of plants, varies in every natural order; often in every genus. But this is not all: it is a mistake to suppose that a knowledge, however intimate, of one genus or order alone, suffices to enable an observer to pronounce upon what characters are of specific importance in that group; these being points demanding long experience and great familiarity with the Vegetable Kingdom. Hence it is, that botanists of experience attach little scientific value to the determinations of species of *Cinchona* or *Sarsaparilla* by characters drawn from the colour, the cracks of the bark, or fracture, in the drugs

they yield. In these and in very many similar cases, the diagnosis which is of the greatest importance in estimating the commercial value of the product, is a speciality of the variety sought, and is due to the time of collecting, its mode of preparation, or of the particular part of the plant from which the article is collected, and is not the expression of any natural characters by which the species producing it can be recognized scientifically.

§ 1. *Flores solitarii.*

1. Amomum *Melegueta*, Roscoe, Mon. Plants.; foliis anguste lanceolatis, vaginis gracilibus, scapo 1-floro, bracteis lineari-oblongis cuspidatis, perianthio exteriore spathaceo acuminato, interiore foliolo dorsali oblongo, lateralibus e basi lanceolata sensim acuminatis, labello late obovato-quadrato margine undulato crispato, filamenti processubus lateralibus subulatis, antheræ lobo terminali subtriangulari apice integro obtuso dentato v. bifido angulis lateralibus subelongatis subulatisve, ovario glabro, staminodiis liberis subulatis, fructu ampullaceo ovato v. elliptico-oblongo glabro, perianthii tubo æquilongo coronato, seminibus angulato-globosis pallide brunneis, testa nitida verruculata. —*Pereira, in Pharm. Journ. v.* 6. *p.* 412; *Mat. Med. v.* 2. *p.* 1131. *f.* 235–241. *Guibourt, Hist. Nat. des Drogues simples, v.* 2. *p.* 222.

Hab. Accra, Yorruba, and Sierra Leone, *Dr. Daniell.* Nom. vern. "Attare," West Africa, and "Tokolo nipomah" of Fernando Po.

Folia angusta, basi acuta, apice longe acuminata, spithamæa ad bipedalia, læte viridia, nervis costa parallelis, ligula truncata brevi, vagina valde elongata. *Scapus* sæpissime valde arcuatus, gracilis, 2–4 unc. longus. *Bracteæ* numerosæ, subdistichæ, appressæ, 1–2 unc. longæ, apice rotundatæ et cuspide basi lata dorsali instructæ, luride virides. *Flores* odori, magnitudine variabiles. *Perianthii* interni *tubus* foliolis æquilongus, utrinque sulcatus, foliolo dorsali multinervi, labello albido extus marginibusque purpureo tincto, intus secus medium aureo. *Antheræ* lobo terminali albido, marginibus roseis. *Staminodia* subulata, acuta v. emarginata. *Stylus* dorso incrassatus, stigmate aureo. *Fructus* carnosus, 1–5 unc. longus, forma varia, elliptica, ampullacea, oblonga, v. ovato-oblonga, v. obpyriformis, glaberrima, pulpa carnosa. *Semina* valde aromatica et pungentia, $\frac{1}{8}$ unc. longa, colore varia, intensiore v. pallidiore, areola conica ad hilum plus minusve elongata lutea v. subnulla.

This is undoubtedly the best and true *Granum-Paradisi* of our shops, and the *A. Melegueta* of Roscoe, whose figures and descriptions of the flower and fruit are excellent. It is widely different from the *A. Granum-Paradisi* of Smith, with which Pereira was disposed to unite it. It varies extremely in the size of all its parts, the smaller states inhabiting drier and alpine localities. It is the only single-flowered species, and no other known one has similarly aromatic and pungent seeds, nor so characteristic a pale brown tuberculated testa. Roscoe remarks also, that the epigynous processes (abortive stamina) are longer than in any other species known to him. Numerous specimens of the fruit and seeds are preserved in the Kew Museum, from various parts of the west coast of Africa, and from Demerara. None differ particularly in the aromatic and pungent taste of the seed, nor in its peculiar testa; but they vary considerably in size and in the length, breadth, and colour of the often conical areola at the hilum. The name *Melegueta* is applied by the Portuguese to various aromatic substances.

§ 2. *Scapi bi- v. pluri-flori.*

a. *Labellum angustum, pendulum.*

2. Amomum *Danielli*, Hook. fil. in Journ. Bot. vol. iv. 129. t. 5 (sub nom. *A. Afzelii*). "Bastard Meligetta," *Pereira, Mat. Med. v.* 2. *f.* 251, 252. A. macrospermum? *Sm. in Rees' Cycl. v.* 39. *Pereira, Mat. Med. v.* 2. *p.* 1139. *Guibourt, Hist. Nat. de Drogues simples, v.* 2. *p.* 218. *f.* 119? Zingiber Melegueta, *Gærtner, de Fruct. v.* 1. *p.* 34. *t.* 12. *f.* 1.

Var. β. *purpureum;* flore purpureo, anthera apice truncata. A. Danielli, *Hook. Bot. Mag. t.* 4764.

Hab. Gold and Slave Coasts, Clarence Town, Sierra Leone, and Fernando Po, *Dr. Daniell.* Fl. June and July. Nom. vern. "Barsalo."—Var. β. Sierra Leone, *Daniell.*

This species is easily distinguished by its golden-yellow flowers, and by its narrow labellum, which hangs forward like that of an Orchidaceous plant. The pulp surrounding the seeds is acid. It appears impossible to pronounce positively whether this be the *A. macrospermum* of Rees Cyclopædia.

The variety β was cultivated at Kew, from seeds sent home by Dr. Daniell, and gathered, he believes, from specimens that had golden-yellow flowers; its flowers were red-purplish with yellow on the lip

and filaments; the apex of the anther is truncated, in which respect only it differs from *A. Danielli.*

b. *Labellum amplum, erectum, limbo horizontali-explanato.*

3. Amomum *Granum-Paradisi,* Linn. Sp. pl. 1. p. 2; foliis elliptico-lanceolatis acuminatis, ligula obtusa v. biloba, scapo multifloro, bracteis laxe imbricatis puberulis obtusis mucronatis, perianthio exteriore tubo brevi limbo obtuso, interiore extus puberulo, lobis lateralibus obtusis, dorsali ovato-oblongo obtuso, labello amplo late obovato-rotundato, marginibus undulato-plicatis, filamento basi utrinque processubus 2 subulatis, antheræ apice integro v. bifido lobulis lateralibus patulis subulatis loculis puberulis, staminodiis linearibus obtusis, ovario pubescente, fructu ampullaceo v. elliptico-ovato v. lanceolato profunde sulcato pubescente, seminibus brunneis subquadrato-rotundatis, testa atro-brunnea nitida.—*Smith, in Rees' Cycl. v.* 39. *Pereira, Mat. Med. v.* 2. *p.* 1130. *f.* 234. *Pharm. Journ. v.* 6. *p.* 412. *Guibourt, Hist. Nat. des Drogues Simples, v.* 2. *p.* 221. *f.* 122. *Hook. Bot. Mag. t.* 4603.

A. grandiflorum, *Sm. Exot. Flora, v.* 1. *t.* 111.

A. exscapum, *Sims, Ann. Bot. v.* 1. *p.* 248. *t.* 13.

A. Afzelii? *Roscoe, in Linn. Trans. v.* 8. *p.* 354. *Smith, in Rees' Cycl. v.* 39.

HAB. Sierra Leone, *Dr. Daniell.*

Herba 3–5-pedalis. *Folia* 4–8 unc. longa, 1–1$\frac{3}{4}$ lata, basi subacuta, apice attenuato-acuminata, marginibus purpureis, vaginis viridibus purpureisve, ligula $\frac{1}{8}$–$\frac{1}{6}$ unc. longa, obtusa v. biloba. *Scapi* 2–4 unc. longi, ascendentes, pubescentes, 3–5-flori. *Bracteæ* remotæ, laxe imbricatæ, late oblongæ, apice obtusæ v. bilobæ, post anthesin deciduæ. *Flores* erecti, 2–3 unc. longi. *Perianthium* album, extus roseo tinctum, labello erecto intus aureo, lobo dorsali lateralibus æquilongo labello breviores. *Filamentum* processubus 2 basi instructa, quarum 2 exteriores minores. *Antheræ* loculi pubescentes, lobo terminali late truncato, lobulo intermedio brevissimo integro v. bifido, lateralibus cornutis. *Fructus* pubescens, atro-purpureus, carnosus, ampullaceus, subcompressus, 9–10-costatus, sulcis acutis, costis $\frac{1}{2}$-teretibus, 2–3 unc. longus, 1$\frac{1}{2}$–2 unc. latus. *Semina* immatura alba, demum brunnea, nitida.

The sheaths of the leaves vary from red-purple to green. Unripe

specimens of the fruit have the seeds covered with a very pale silvery epidermis, whereas older ones are very dark brown and shining. *Calyx* obtuse or three-toothed at the apex (not cut into three long segments, as described in the 'Botanical Magazine,' nor are the lateral lobes of the perianth absent, as there supposed). The seeds are as aromatic as those of *A. Melegueta*, Roscoe, but less pungent.

The short tube of the perianth, pubescent scape, bracts, perianth, and fruit, together with the furrows on the latter, well distinguish this species.

4. Amomum *longiscapum*, Hook. fil.; foliis approximatis lineari-lanceolatis longe acuminatis basi truncatis cordato-bilobis, ligula brevissima truncata, scapo elongato erecto, bracteis plurimis appressis sensim longioribus superioribus late oblongis obtusis truncatisve, floribus 3–5 terminalibus, calycis tubo elongato apice acuto, perianthii lobis lateralibus e basi lata sensim angustatis dorsali oblongo-obtuso, labelli limbo amplo late obovato rotundato margine undulato-plicato, filamento brevi basi utrinque processubus 2 inæqualibus instructo, antheræ lobo terminali apice rotundato lobulis lateralibus cornutis ascendentibus, staminodiis liberis linearibus, fructu anguste lanceolato compresso trigono, seminibus immaturis.

HAB. Regent, and Sugar-loaf Mountain, Sierra Leone, *Dr. Daniell*.

Herba elata, glaberrima. *Folia* pedalia, 2½ unc. lata. *Scapi* 6–10-unciales, graciles. *Bracteæ* inferiores parvæ, superiores latæ, 2-unciales, purpureo-maculatæ. *Flores* ampli, inodori. *Perianthii* tubus gracilis; labellum purpureum, basi albidum. *Anthera* purpurea. *Fructus* siccus 2½–3 unc. longus (excl. perianth.), ¾ unc. latus, glaber, parietibus ut videtur vix carnosis. *Semina* immatura, valde angulata, arillo papyraceo tecta.

A very handsome species, conspicuous for the cordate bases of its leaves; very short, almost obsolete ligula; and very long scapes, with large blotched upper bracteæ, while the lower bracts are small and very numerous.

5. Amomum *cereum*, Hook. fil.; foliis lineari-lanceolatis (basi obliquis) apice longe acuminatis, ligula brevi truncata, scapo gracili elongato sub-6-floro, bracteis appressis obtusis truncatisve cuspidatis, calycis spathacei tubo elongato ore brevi apice subacuto, perianthii interni tubo basi solido lobis lateralibus linearibus obtusis dorsali oblongo-obtuso, labello amplo late rotundato margine crispato plicato, fila-

mento basi utrinque processu cornuto, antheræ lobo terminali apice truncato lateralibus divaricatis subulatis, staminodiis coadunatis apice tantum liberis, ovario glabro superne solido elongato, fructu lineari-lanceolato, seminibus majusculis angulatis pulpa (sicco tenui) immersis, testa læte brunnea.—*An* A. citratum, *Pereira*, *Mat. Med. v.* 2. *p.* 1137?

HAB. Regent, Sierra Leone, *Dr. Daniell.*

Folia 6–10 unc. longa, 1–1½ lata, basi superiore breviore in petiolum brevem decurrente. *Scapi* floriferi 4 unc., fructiferi 8 unc. longi, graciles. *Bracteæ* sensim majores, superiores, ½–2-unciales. *Flores* albi, cerei. *Calycis* spathacei tubus compressus, ore seu limbo brevi. *Perianthii* interioris tubus basi cum apice ovarii basique staminodiorum in columnam solidam coadunatis, lobi albi, labello cereo. *Anthera* flava, connectivi marginibus roseis. *Staminodia* in vaginam latere fissam styli basin amplectentem coadunata. *Fructus* gracilis, apice rostratus, 2–2½ unc. longus, siccus ⅓ unc. latus, parietibus ut videtur coriaceis. *Semina* magna, ⅛ unc. diametro, insapida.

This most beautiful species is readily distinguished by its long scapes, which are very slender in fruit, by the short mouth of the calyx, white waxy corolla, with a very broad labellum, and especially by the solid base of the tube of the perianth, which is continuous with the solid elongated top of the ovary. The coadunate staminodia afford also an excellent character. The seeds appear to be quite flavourless. I have hazarded the conjecture that this may be the *A. citratum* of Pereira, described from a few dried fruits.

Dr. Daniell has also brought leaves and fruit of a sixth species of *Amomum*, which is apparently the *A. latifolium* of Afzelius: the fruit is very large, broadly flagon-shaped, 2–3 inches long, 1½–2½ broad, and with very thick and coriaceous walls. The seeds much resemble grape-stones, but are more cylindrical; they are pale greyish-brown, tasteless, and have a crenulate ridge (raphe) running down one side. The leaves are broad lanceolate, sessile, and acute at the base.

Descriptions of some new Genera and Species of CEYLON PLANTS; *by* G. H. K. THWAITES, ESQ., *Superintendent of the Royal Botanic Garden at Peradenia.*

(*Continued from p.* 72.)

(TAB. IX., X.)

Nov. Gen. STREPTOSTIGMA, *Thw.* Nat. Ord. Sapindaceæ.

Char. Gen. Flores hermaphroditi. *Calyx* profunde 5-partitus; laciniis ovato-oblongis, imbricatis, deciduis. *Corollæ* petala 5, unguiculata, retusa, calycis laciniis alterna, iisdem longiora; unguis linearis, limbum oblongum auriculatum fere æquans. *Discus* emarginatus, genitalia cingens. *Stamina* 5, æqualia, ovario approximata; *filamenta* subulata; *antheræ* oblongæ, introrsæ, longitudinaliter dehiscentes, rima dorsali prope basin affixæ. *Ovarium* sessile, compressum, biloculare. *Ovula* in loculis bina, superposita, amphitropa. *Stylus* simplex, exsertus. *Stigma* indivisum, spiraliter tortum. *Capsula* membranacea, inflata, biloba, bilocularis, loculicide bivalvis. *Semina* in loculis bina, superposita, horizontalia, arillo parvo disciformi prope hilum munita; testa membranacea. *Embryonis* exalbuminosi *cotyledones* crassissimi, incumbentes; *radicula* brevis, umbilico proxima.—Arbor *ingens*, Zeylanica, *ramosa;* ramulis *teretibus, minute pubescentibus;* foliis *exstipulatis, alternis, abrupte* 6–10-*foliolatis;* foliolis *membranaceis, penniveniis, suboppositis, integris,* 2–4 *poll. longis, ovato-acuminatis, basi angustatis, obliquis;* inflorescentia *laxe paniculata, minute pubescente,* pedicellis *tenuibus,* 6–7 *lin. longis, e basi gradatim incrassatis, bracteolatis;* floribus 5 *lin. longis, viridibus.*

Streptostigma *viridiflorum,* Thw.—C.P. No. 605, in Herbario Peradeniensi. (TAB. IX. A.)

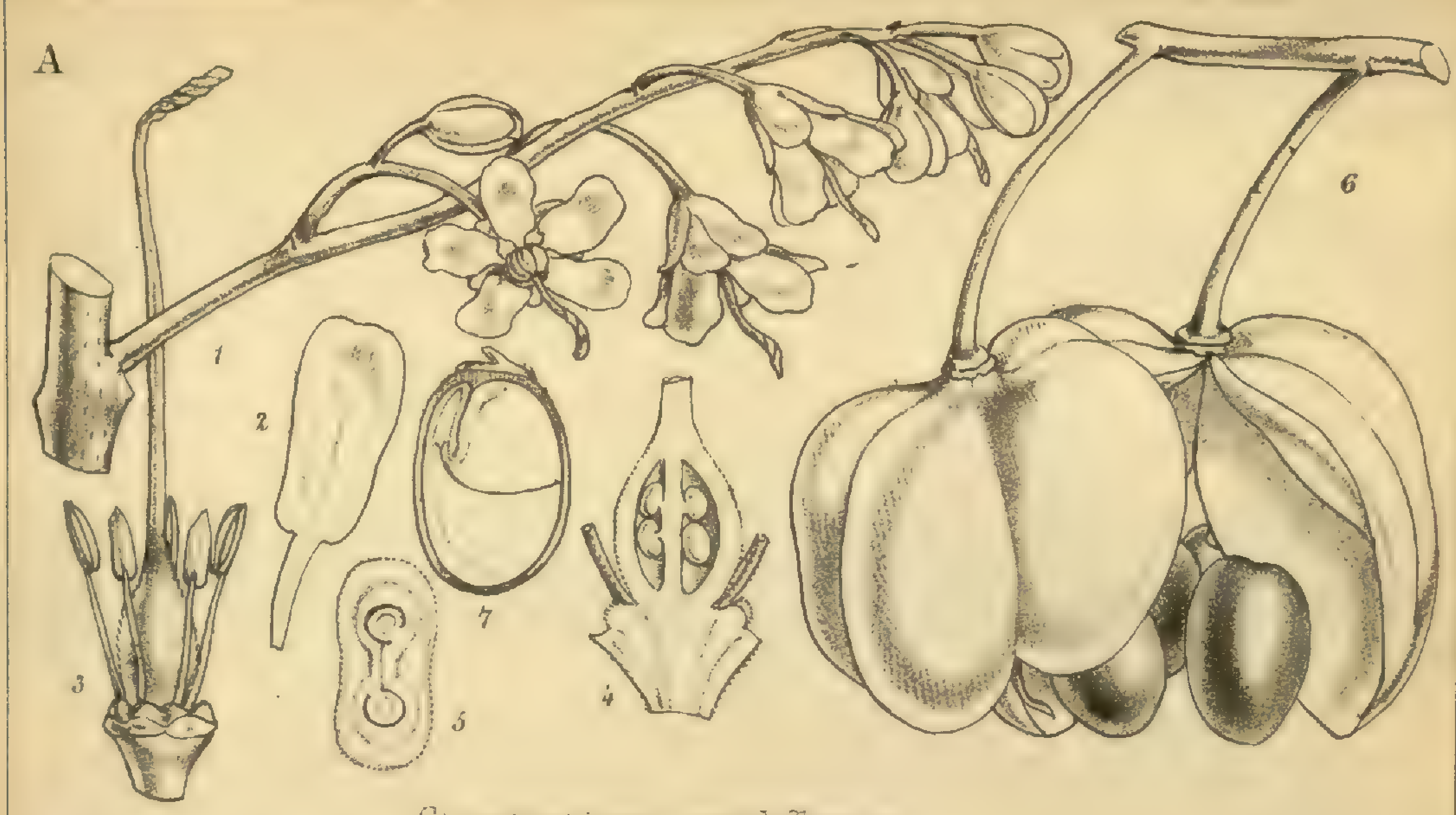
HAB. A large forest-tree, not uncommon in the central province of Ceylon. The native name is *Pennella.*

PLATE IX. A. Fig. 1. Flowering raceme of *Streptostigma viridiflorum.* 2. A petal. 3. Stamina and ovarium. 4. Longitudinal section of ovary. 5. Transverse section of ovary. 6. Fruit. 7. Section of ripe seed.

Nov. Gen. PROSORUS, *Dalzell, in Hook. Journ. Bot. v.* iv. *p.* 345. Nat. Ord. Euphorbiaceæ. Tribe Phyllantheæ.

Char. Gen. Flores dioici. *Calyx* 4-partitus; laciniis oblongis, imbri-

A



Streptostigma viridiflorum.

B

Allæanthus zeylanicum.

C

Helminthospermum scabridum.

W. & J. & H. De Alwis del. Fitch lith. Vincent Brooks Imp.

Chætocarpus pungens.

Mischodon zeylanicus.

Prosporus indica.

Fitch lith.

catis, 2 externis. *Corolla* 0. *Discus* patelliformis, imo basi calycis coalitus.—Masc. *Stamina* 4, sub-biseriata, calycis laciniis opposita; *filamentis* brevibus, liberis; *antheris* oblongis, adnatis, extrorsis, longitudinaliter dehiscentibus. *Ovarii* rudimentum nullum.—Fœm. *Stamina* nulla. *Ovarium* triloculare, loculis biovulatis. *Stylus* brevissimus; *stigmata* 3, profunde bifida, recurvata. *Capsula* tricocca, coccis bivalvibus, dispermis. *Semina* asymmetrica; *testa* ossea; duo in arillo uno subligneo, profunde fisso (vel bilobato) immersa. *Embryo cotyledonibus* foliaceis, cordatis; *radicula* brevi. *Albumen* mediocre, carnosum.—Arbor 30–40-*pedalis, ramosissima;* ramulis *teretibus, cinerascentibus, junioribus compressis.* Folia *alterna, disticha, integerrima, ovato-lanceolata, acuminata, basi augustata, subtus pallidiora, glaucescentia,* 2–4½ *poll. longa,* 1–1¾ *poll. lata;* petiolis *superne sulcatis,* 2–4 *lin. longis.* Stipulæ *lanceolatæ, subserratæ,* 1¼ *lin. longæ, deciduæ.* Flores *pallide virides, fasciculati, axillares,* 2 *lin. longi.* Pedunculi *tenues, basi bracteati,* 5–7 *lin. longi.* Capsulæ *subsphæricæ,* 5 *lin. diam.* Arillus *semina matura includens, cyaneus, nitidus.*

Prosorus *Indicus,* Dalzell.—C.P. No. 2155, in Herbario Peradeniensi.

Hab. A very common tree in the central and southern parts of the Island; conspicuous in the forests, from its pale green, somewhat glaucous leaves.—It is quite or nearly bare of foliage for a short time before the flowers and young leaves make their appearance. The wood is white and tough, and used for building purposes by the natives. The tree is called *Carrou* by the Cinghalese, and *Sooddooleeyang* by the Kandians. The seeds are a favourite food of the Green Pigeon.

Plate X. C. Fig. 1. Branch of *Prosorus,* with male flowers. 2. Male flower, *magnified.* 3. Branch of *Prosorus* with young fruit. 4. An immature capsule. 5. Transverse section of immature capsule. 6. Longitudinal section of immature seed, and investing arillus. 7. Mature capsule with an arillus and bivalve putamen separate. 8. Longitudinal section of an arillus, showing the two enclosed seeds. 9. Seed. 10. Embryo.

Nov. Gen. Mischodon, *Thw.* Nat. Ord. Euphorbiaceæ.

Tribe Crotoneæ.

Char. Gen. Flores dioici.—Masc. *Calyx* 6-partitus, laciniis imbricatis.

Corolla nulla. *Stamina* 6, calycis laciniis opposita, *ovarii rudimentum* cingentia; *filamentis* liberis; *antheris* oblongis, extrorsis, dorso affixis, longitudinaliter dehiscentibus.—Fœm. *Capsula* subangularis, subdepressa, tricocca, coccis monospermis. *Semina* oblonga, lævia, *testa* membranacea. *Embryo* cotyledonibus oblongis, planis; radicula brevi. *Albumen* carnosum, mediocre.—Arbor 30–40-*pedalis, ramosa, cortice scabro;* ramulis *teretibus, junioribus subtetragonis, pubescentibus;* foliis *verticillatis (verticillis sæpissime* 4-*phyllis), integerrimis, oblongis, basin versus angustatis,* 4–15 *poll. longis,* 1–5 *poll. latis, subtus minute reticulatis, glabris, junioribus minute pubescentibus;* petiolis ½–3 *poll. longis, cylindricis, apice parce tumidis, prope basin dentibus* 2, *subulatis, parvis* (stipulis) *instructis, pube decidua tectis*:—Masc. paniculis *multifloris, axillaribus, bracteatis, pubescentibus, foliis brevioribus;* floribus *flavo-rufescentibus,* 1½ *lin. longis;* pedicellis 1–2 *lin. longis*:—Fœm. capsulis 4 *lin. longis,* 6 *lin. latis.*

Mischodon *Zeylanicus*, Thw.—C.P. No. 557, in Herbario Peradeniensi. (Tab. X. B.)

Hab. A very handsome tree, with spreading, somewhat pendent branches. The leaves are of a lively green colour, and when young of a brilliant red. It would seem to be rare, as I have met with it but once in my botanical excursions; and then I found a good many trees in one spot, near Ooma Oya, on the lower Badulla road, about twenty-five miles from Kandy. Dr. Gardner discovered this species on the Hantani range, near Kandy; but the forest in which it occurred, has been cleared for coffee-planting.

Plate X. B. Fig. 1. Male flowering branch of *Mischodon Zeylanicus.* 2, 3. Flowers. 4. Nearly ripe capsules. 5. A coccus, and ripe seed. 6, 7. Section of ripe seed.

Nov. Gen. Chætocarpus, *Thw.* Nat. Ord. Euphorbiaceæ.

Tribe Crotoneæ.

Char. Gen. Flores dioici. *Calyx* profunde 4-partitus, laciniis ovatis, imbricatis. *Corolla* nulla.—Masc. *Stamina* 8; *filamenta* (quorum 4 exteriora) in columnam centralem disco annulari colorato irregulariter lobato impositam coalita, dimidio superiore libera; *antheræ* ovales, adnatæ, introrsæ, longitudinaliter dehiscentes.—Fœm. *Ovarium* liberum, sessile, setis longis patentibus deciduis dense vestitum, basi disco parvo undulato cinctum, triloculare; loculis 1-spermis.

Styli 3, fere ad basin bifidi, fimbriati. *Capsula* muricata, trilocularis, *putamine* osseo loculicide dehiscente. *Semina* ovata, nitida, singula inter lobos duos arilli carnosi pendula; *cotyledones* plani, foliacei; *radicula* parva, prope hilum posita; *albumen* copiosum.—Arbor *Zeylanica, ramosa;* ramulis *teretibus, minute pubescentibus;* foliis *alternis*, 3 *poll. longis*, $1\frac{1}{2}$ *poll. latis, integerrimis, lanceolatis, ad petiolum* 4 *lin. longum angustatis;* stipulis *lineari-lanceolatis, deciduis; inflorescentia axillari, fasciculata;* floribus 3 *lin. longis, breve pedicellatis, minute pubescentibus, viridibus;* capsula 1 *poll. longa*, $\frac{3}{4}$ *poll. lata;* seminibus *nigris, nitidis;* arillo *rubro.*

Chætocarpus *pungens*, Thw.—C.P. No. 2641, in Herbario Peradeniensi. (Tab. X. A.)

Hab. A common forest-tree in the Ratnapoora and Ambagamowa districts of Ceylon. The wood is very hard. The native name of the tree is *Hadoca.*

To this genus must be referred the *Adelia castanocarpa* of Roxburgh.

Plate X. A. Fig. 1. Branch of the *Chætocarpus pungens*, with male flowers. 2. A male flower, *magnified.* 3. Branch of the *Chætocarpus*, with female flowers and young fruit. 4. A female flower, *magnified.* 5. Transverse section of ovary. 6. Ripe fruit. 7. Ripe fruit, with one of the valves removed, showing the ripe seed in one loculus and an abortive one in the other. 8, 9. Sections of seeds, showing cotyledones.

Nov. Gen. Helminthospermum, *Thw.* Nat. Ord. Ulmaceæ.

Char. Gen. Flores dioici, parvi.—Masc. in paniculis brevibus, axillaribus, paucifloris, hirsutis; pedicellis brevibus, bracteolatis. *Perigonium* 5-phyllum. *Stamina* 5, perigonii foliolis subæqualibus opposita; *filamenta* libera, linearia, subcompressa, apice incurva, demum rectiuscula; *antheræ* introrsæ, biloculares, cordato-acuminatæ, dorso affixæ. *Ovarii* rudimentum vix ullum, densissime lanosum.—Flor. Fœm. subsolitarii; pedicellis longioribus. *Perigonium* 4-phyllum, persistens. *Stamina* nulla. *Ovarium* sessile, hirsutum, uniloculare. *Ovulum* unicum, parieti prope apicem appensum, amphitropum, micropyle supera. *Stylus* ad basin bifidus, laciniis filiformibus, latere interiore stigmatosis. *Drupa* carnosa, putamine osseo. *Semen* exalbuminosum, pendulum, vermiforme, contortum; *radicula* crassiuscula, supera.—Arbor *mediocris* Zeylanica, *ramosa;* ramulis *teretibus, scabris.* Foliis *alternis*, 2–4 *poll. longis*, 1–2 *poll. latis, simplicibus,*

scabris, subserratis, breve petiolatis, lanceolato-acuminatis, ad basin angustatis, penniveniis. Stipulis ½ *poll. longis, pilis rigidis minutis, convolutis, basi caulem cingentibus, deciduis.*

Helminthospermum *scabridum*, Thw.—C.P. No. 716, in Herbario Peradeniensi. (TAB. IX. C.)

HAB. A moderate-sized tree, not uncommon in the forest of the central province of Ceylon.

This genus seems to form a connecting link between the natural families *Moreæ* and *Ulmaceæ*, agreeing with the former in its unisexual, not polygamous flowers, and with the latter in the structure of its ovary.

PLATE IX. C. Fig. 1. *Helminthospermum scabridum*, masc. 2. Male flower, *magnified.* 3. Female flower, *magnified.* 4. Longitudinal section of ovary. 5. Female flower. 6. Longitudinal section of ripe seed.

Nov. Gen. ALLÆANTHUS, *Thw.* Nat. Ord. Artocarpeæ.

Char. Gen. Flores dioici.—MASC. numerosissimi, in spicis axillaribus, elongatis, unilateralibus, hirsutis, pedunculatis dense aggregati. *Perigonium* 4-fidum, laciniis imbricatis. *Stamina* 4, perigonii laciniis opposita; *filamentis* complanatis, in æstivatione inflexis; *antheris* subquadratis, introrsis, longitudinaliter dehiscentibus. *Ovarii* rudimentum parvum, conico-subulatum.—FŒM. *Flores* pauci, inter multa perigonidia sterilia, carnosa, squamæformia, hirsuta immersi, et cum iisdem in capitulis globosis, axillaribus, breve pedunculatis dense aggregati. *Perigonium* tubulosum, irregulariter 4-fissum. *Ovarium* liberum, subcompressum, 1-loculare, 1-ovulatum. *Ovulum* prope loculi apicem pendulum, campylotropum. *Stylus* terminalis, simplex (raro bifidus, segmentis inæqualibus), longe exsertus, per totam fere longitudinem stigmatosus. *Fructum* maturum nondum vidi.—Arbor 30–40-*pedalis;* ramulis *lactescentibus, teretibus, hirsutis;* foliis *alternis, distichis, cordato-lanceolatis, acuminatis, argute serratis, hirsutis, penniveniis* (*venis primariis apice incurvatis, folii margini non attingentibus*), *subtus pallidioribus, venosis,* 3–4 *poll. longis,* 1¼–1¾ *poll. latis, deciduis;* petiolo *supra sulcato, hirsuto,* 3 *lin. longo;* stipulis *oblongis, acuminatis, membranaceis, sublævibus, striatis, obliquis, deciduis,* 2 *lin. longis,* 1¼ *lin. latis.*—FLOR. MASC. spicis 1–2¼ *poll. longis,* 2 *lin. latis;* pedunculo 2–2½ *lin. longo.*—FLOR. FŒM. capitulis 4 *lin. diam.;* pedunculo *brevissimo.*

Allæanthus *Zeylanicus*, Thw.—C.P. No. 2215, in Herbario Peradeniensi. (TAB. IX. B.)

HAB. A large deciduous tree, occurring in the Central Province, at an elevation of from 1000 to 2000 feet, most frequently at the margins of rivers. The native name is *Allandoo*, or *Allandoo-gaha.*

The liber of this tree is exceedingly tough; and I have been told that the Kandians sometimes make bags of the inner bark of the trunk, in the same way that they prepare them from the bark of the *Antiaris saccadora* (*Ritti-gaha* of the Cinghalese), and that at one time paper was made from it; but a Kandian Headman, whom I lately asked respecting this matter, was only aware of the *Antiaris* being employed for these purposes. I have written to a native gentleman, requesting him to make inquiries for me, and to procure, if possible, specimens of the bags and paper.

PLATE IX. B. Fig. 1. Male flowering branch of *Allæanthus Zeylanicus.* 2. Male flower, *magnified.* 3. Female flowering branch of *A. Zeylanicus.* 4. Section of capitulum, *magnified.* 5. Scale or barren perigonidia. 6. Female flower. 7. Perigonium of female flower. 8. Section of ovary, showing the ovule. 9. Ovary with bifid style.

Gen. PLECOSPERMUM, *Trécul.*

Plecospermum *cuneifolium*, Thw.—C.P. No. 2526, in Herbario Peradeniensi. *Frutex* scandens, spinosus; *spinis* solitariis, axillaribus, 4–5 lin. longis, decurvatis; *foliis* cuneato-lanceolatis, acuminatis, lævibus, integerrimis, penniveniis, subtus pallidioribus, venosis, 1¾–3 poll. longis, ¾–1 poll. latis; *petiolo* 3–4 lin. longo; *stipulis* minutis, cuspidatis, hirsutis, deciduis; *capitulis flor. fœm.* hirsutis, sphæricis, areolatis, demum sublobatis, 6–9 lin. diametro.; pedunculo 2 lin. longo; *floribus* perigonidiisque subliberis, non (ut in *P. spinosum*, Trécul) connatis; *stylo* simplici, breve exserto.—FL. MASC. capitati, capitulis breve pedunculatis; antheris omnino inclusis.

HAB. The present species has as yet only been met with in two localities, not very far apart, in the Central Province.

This is a very distinct species, though it bears at first sight a considerable resemblance to the much more abundant *Plecospermum spinosum*, Trécul, and Wight Icon. (C.P. No. 2212, in Herbario Peradeniensi); its leaves, however, are wedge-shaped, and of a firmer texture than those of *P. spinosum;* the spines are much smaller; the female

capitula are a good deal larger, and are on much shorter peduncles; the fertile and barren perigonia are not consolidated into one mass, but easily separable.

Jumping or Moving Seeds.

A gentleman, belonging to an eminent mercantile Mexican Company, lately did me the favour to communicate the fact, that a Mexican traveller had just arrived at Southampton, bringing, what he considered to be a great curiosity and upon which he set a very high price, namely some *jumping* or *moving* seeds, obtained from the coast of the Pacific. They had excited great interest among the passengers of the Steamer, and many a weary hour had no doubt been lightened by witnessing their gambols and speculating on the cause of motion. Fortunately our English Minister at Mexico, Percy W. Doyle, Esq., had obtained some of these seeds, and he forwarded them to England by the same mail steamer to which we have just alluded; and through the kindness of George Lenox-Conyngham, Esq., of the Foreign Office, and of the Hon. Charles Augustus Murray (lately our Minister Plenipotentiary for Switzerland, and now appointed to Persia, both great friends to the Royal Gardens, and the Museum), I was soon in possession of some. Marvellous and startling did their movements appear.

Every one is familiar with the hygrometric contortions of a species of wild Oat. Here was nothing of that kind: the seeds were altogether of another structure, about the size of a small horse-bean. Their real nature will be best understood by saying that the fruit to which they belong has an affinity to that of an *Euphorbia* or *Spurge*, and very much resembles the common *Caper-Spurge* of our gardens, which, as is well known, is a three-lobed fruit, or capsule, and separates, when ripe, into three portions, or three seeds, each surrounded by its hard shell; and the shape of each of these shelly seeds is convex on the back, and nearly plane, having, however, a slightly projecting ridge or keel in the centre, on the front, or inner side. If asked to guess at the plant to which the seed belongs, I should say, to some species of *Colliguaya**, a common shrub on the coast of Chili. When these seeds, of which I received three, were placed on the convex back, they shortly began to stir,—first

* And very probably to the *Colliguaya odorifera*, Hook., figured in the Bot. Misc. vol. i. p. 142. t. 40.

one, then a second, then a third. Sometimes, the motion was continued (always in jerks) for some minutes; sometimes, one or other seed would remain quiet for a few seconds or minutes, or even for half an hour. While active, the movement was generally what sailors would call fore and aft, with little or no progression: now and then, a very sudden jerk would bring a seed on one of its ends, and sometimes it toppled completely over, and lay on its nearly plane side. In this position the motion is different, being progressive, forward or backward, at times so continuous in one direction that the seed fairly works its way off the sheet of letter-paper on which it has been placed, and, finally, off the table! This steady direction struck us as the most remarkable feature of the movement, for it seemed to indicate a degree of intention.

After that several scientific friends, as well as myself, had gratified ourselves with this spectacle for some time, it was suggested that possibly an insect within the shell might be the occasion of these peristaltic movements, and it was resolved to sacrifice one of the seeds. Externally, indeed, there is not, even when seen under a microscope, the smallest appearance of aperture or injury in the shell, no breathing-hole. With a knife the shell was carefully laid open, and then appeared the cause of all these strange contortions, in the form of a fine maggot,—the larva, probably, of some beetle (*Curculio*), fat and white, occupying nearly the whole cavity. It bore considerable resemblance, as far as can be stated without direct comparison, to the larva of *Curculio nucum* of our own nuts. In all the three instances that have now been examined, the creature had completely eaten up the seed or kernel, and the cavity contained nothing but the insect, lying in a curved form in the hollow of the shell. It has feet, indeed, but so minute that it would not appear they could be intended for walking. Its movements, if I may so say, appeared muscular, never in very rapid succession, and like what we see in the spring of a salmon or dolphin out of the water: and to every motion of this kind, of the insect within the shell, the seed or nut responds. It is not so easy to account for the forward impulse in a continuous line when the seed lies on its flatter side; but it may be due to the movement of the insect, and the pressure against the shell being for a time in one and the same direction, and in the form of the seed being longer than broad; and probably, in some measure, to the little ridge or keel, so that, being impelled to move, it is in a continued line, like that of a boat, even when influenced by a side-wind.

It is hoped that some of these seeds may have been given to an Entomologist, and that the insect may be reared to its perfect state. The kernel, like most of the Euphorbia-tribe, is probably of an acrid or poisonous nature to man or other animals.—W. J. H.

Since the above was written, a seed that had been accidentally crushed, and so laid open, showed the perfect larva within, which continued quiet for some days, but has now spun a beautifully white silky web, entirely concealing itself, and in which it will probably undergo its transformation; and, while we are in the press, Mr. Lenox-Conyngham communicates the following memorandum to us:—

"I am sorry I have not previously had leisure to report progress relating to our locomotive seeds, and my *post mortem* examination of the one that appeared, when I lately observed it, to contain a live insect with feelers, and his head looking out through a hole he had cut for himself in the wall of his house. On opening his house—the seed-vessel—I found that the inside was filled with silk or cotton, in which the insect had carefully wrapped himself up. Opposite the external aperture was a corresponding one in the coccoon, and through these holes the insect's head was a little protruded. When I separated the two sides of the seed, the insect dropped through the hole in his coccoon, and I then examined it with a magnifying glass. It looked a perfectly developed small fly, with wings lying flat on its back. Proceeding from the crown of its head were two rather long antennæ; and it had the usual number of legs (six), of a reddish tinge. This is a very unartistic description of what its appearance was when I opened it; but I think it best that you should know what it was, before you see what it is. I have it all ready for your inspection."

It now only remains for us to place the insect in the hands of a scientific gentleman to determine it entomological character and name; and we have reason to believe that Mr. Westwood will kindly undertaken this duty.

Botanical Obituary.

Never, in the brief period of little more than three months, do we remember to have had occasion to lament the death of so many and such able Botanists as at the present period: these, too, were men of

our own country; for the Continent, *almost* within the same time, has lost Auguste St. Hilaire, Gaudichaud, Adrien de Jussieu, Richard, fils, Ledébour, Fischer, Kunze, Schwægrichen, Reinwardt, Schærer: and again, in our own country, we still feel the loss of Lemann and Bromfield.

We had scarcely announced the demise of Dr. Wallich, than the daily journals conveyed to us the death of

1. JAMES EDWARD WINTERBOTTOM, ESQ.,

Who died at Rhodes, on his return from Egypt and Nubia, and while on his way to Constantinople, in prosecution of further scientific journeys. Of independent fortune, well educated, well informed, possessing a mind deeply imbued with a love of Natural History, and endowed with almost an athletic frame,—it is no wonder he early sought to improve his mind by travelling. Owing to his remarkably retiring habits, and a disposition to avoid whatever might bring him into public notice, it is quite out of our power to do justice to his memory by a statement of all thê services which Mr. Winterbottom has rendered to science. Our earliest acquaintance with him was when he had completed his studies and taken his B.M. degree at Oxford (for he was educated for the medical profession, though he never practised medicine), about the year 1825, in the summer of which year he did us the favour to accompany a party on a botanical excursion to the Breadalbane Mountains. Two circumstances remain strongly impressed upon our memory connected with that tour: one was his ardent zeal in pursuit of plants, and the other an instance of his humanity. A sick sheep had strayed from its companions, and was unable to extricate itself from the dangers of the rocky precipices which almost everywhere surrounded the spot. He took up the animal, which would have been more than a load for any one of the rest of us, and with the greatest care, and all the skill that a practised shepherd might be expected to possess, raised it on his shoulders, and, with only a few moments of rest here and there, carried it a long distance, till he placed it in safety among its companions, near the base of the mountains.

From that period, Mr. Winterbottom was entirely lost sight of, by us at least; a vague report only, that he was gone to travel in India, and as a Botanist, had reached us, till about 1846, when we heard he had joined, as a volunteer, Captain Richard Strachey, who was engaged by the Indian Government to make a survey of certain portions of the Hima-

laya mountains about Kamaon and Thibet. His vigorous constitution, his ardour in the cause of science, and his artistic qualifications, rendered him a most valuable coadjutor on this occasion;—and on the return of these gentlemen to England, in 1849, they occupied the same house in Gower-street, Bedford-square, London, and spent nearly two years in working out their observations, and arranging and naming and distributing their joint collections. As far as the Botanical portion is concerned, we can bear ample testimony to their value, a very full set having been presented to the Herbarium of the Royal Gardens of Kew, which has proved of the greatest use to Drs. Hooker and Thomson, in the preparation of their 'Flora Indica.' Another journey which Mr. Winterbottom undertook, into Kashmere and the adjacent provinces, was equally productive, and in plants of another description. A portion of this is also familiar to us, having been placed in Dr. Hooker's hands for the furtherance of his 'Indian Flora.'

Mr. Winterbottom's presumed object in his last voyage and journey, which commenced in 1852, and from which he did not live to return, was to visit Abyssinia. His botanical friends were, we believe, ignorant of his visit to Egypt and Nubia, till it was announced in the papers, in connection with his death at Rhodes. We have, however, been kindly informed by the family, that they have received, from Beyrout, his collection of Plants, made during his recent tours in Upper Egypt and Nubia, and in Palestine and Syria, which he had left there to be forwarded direct. None of his papers and effects have yet arrived from Rhodes.

Mr. Winterbottom was the son of the late Dr. Winterbottom of Reading. He was a Fellow of the Linnean and Geographical Societies, and a frequent attendant at their meetings; but he never sought notoriety among the members. Though well able to instruct, he preferred being a hearer rather than a teacher. He died of fever, and fell a sacrifice to the cause of Science in the prime of life.

2. JOHN ELLERTON STOCKS, ESQ., M.D., BOMBAY MEDICAL SERVICE.

While the news of the death of Mr. Winterbottom was still, as it were, sounding in our ears, we received the sorrowful tidings of the decease of another Indian Botanist and friend, Dr. Stocks, intelligence which more immediately touched the writer of this article; for Dr. Stocks had been for many months so constantly an inmate of our Library and

Herbarium, as to be in some degree one of ourselves. This event took place at the residence of a relative, where he was on a visit (with an unmarried sister), Samuel Watson, Esq., of Cottingham, near Hull (his native town), at the early age of thirty-four. He received his medical education at University College, London, and profited more than most students by Dr. Lindley's Botanical Lectures. He entered the East India Company's Service on the Bombay Establishment, and was soon appointed Vaccinator in Scinde, and afterwards Inspector of Forests there. His travels in Scinde and Beloochistan were frequent and extensive, and he took advantage of them to improve his knowledge of the Botany of all this remarkable region, which he showed to have a close affinity in its vegetable products with Arabia and Egypt. His collections of specimens were very extensive, and well prepared; and the drawings, done by native artists, under his immediate inspection, are no less so. On Dr. Gibson's visit to England, about three years ago, Dr. Stocks was appointed during his absence to the important duties of Conservator of Forests and Superintendent of Botanic Gardens in Bombay, which gave further opportunity of pursuing his botanical researches, both personally and by means of collectors. His ambition now, was to turn these large collections to account, and to come to England, where alone he could determine the correct nomenclature of the Genera and Species, and where he hoped to publish the new plants, and to distribute his specimens in the manner that would be most beneficial to the cause of Botany.

Dr. Stocks accordingly came to England on furlough, bringing his collections with him, and made Kew his residence; and here he had been busily engaged since the early spring, in comparing them with authentic specimens in the Kew Herbarium, and preparing them for publication. Unfortunately his constitution had been undermined by his great labours in the unhealthy climate of Scinde; he was subject to intense neuralgic pains in the head and neck, and a change of air and scene was deemed desirable. He accordingly spent a few weeks with relations in the Isle of Man; and on his way thence to Cottingham he caught a cold, which was succeeded by fits of apoplexy, which in a very few days terminated fatally, on the afternoon of Wednesday, the 30th of August.

Dr. Stocks had brought to England materials, in a very forward taste, for a general work on the Natural History, Manners, Customs, Arts,

Manufactures and Commerce, Agriculture, etc. etc., of Scinde, which it is yet hoped may be found worthy of publication. Great talent and great research had been bestowed on it; and the information it contains is much of the same nature as that of the late Dr. Francis Buchanan Hamilton's History of the Mysore, but possessing the further advantage of being written in a lively and agreeable style, and rendered doubly valuable from the amount of scientific knowledge of the highest stamp brought to bear upon it. Few men of his years were more extensively read in all subjects connected with the improvement of India, than Dr. Stocks. In that country his death will be much felt; and sure we are that to his personal friends the loss is irreparable, for he possessed a most kind and amiable disposition.

Like Mr. Winterbottom, Dr. Stocks was more gratified by being useful to others than in coming forward as an author; and it was only by the urgent entreaty of his friends that he could be induced to appear in that capacity. Most, if not all, that has yet been printed from his pen, we have been privileged to publish in our Botanical Journals. In the 'London Journal of Botany,' vol. vii. p. 539, will be found some Notes on the Botany (chiefly economic) of Scinde, describing some of the numerous vegetable products he had presented to the Museum at Kew. At p. 550 of the same volume, is a most lively and spirited letter, written during "a botanical excursion to Shah Bilawul, in Beloochistan." In the present Journal or 'Kew Garden Miscellany,' vol. i. p. 257, is an excellent Memoir on two Balsam-trees (*Balsamodendron*) of Scinde, *B. Mukul* and *B. pubescens*, with two plates. In vol. ii. p. 303, will be found an excellent general sketch of the Botany of Beloochistan, written after a second journey into that country. In vol. iii. are descriptions and figures of two new plants of Scinde. Vol. iv. contains descriptions of thirty-seven Beloochistan plants, chiefly new species. His last communication will be seen at p. 314 of the same volume: "Notes on the Botany and the Government Gardens of Bombay."

3. PHILIP BARKER WEBB, ESQ., OF MILFORD HOUSE, SURREY.

Only the day after the intelligence reached us of the demise of Dr. Stocks, a letter was received by Dr. Hooker, from M. J. Gay of Paris, dated September 1, 1854, announcing the death there of Mr. Webb; a Botanist, indeed, more advanced in years, but whose death was equally

unlooked for and more sudden than that of our last mentioned friend; it took place only a few hours later, namely at two o'clock on the morning of Thursday, 31st of August. "Vous étiez, comme moi," writes M. Gay, "ami de M. Webb, et comme moi vous savez tout ce qu'il y avait de charme et de nobles qualités dans cet homme scientifique. Hélas, c'est une triste perte pour l'amitié et pour la science! Il nous a été enlevé hier matin par une attaque de choléra, et je suis maintenant livré aux tristes soins qu'exige la conservation de son corps, en attendant son frère l'Amiral, qui doit être à Genève et que j'ai mandé par la télégraphe. C'est pour moi, qui avais toute sa confiance, une perte immense, une perte irréparable."

In another letter from the same friend of Mr. Webb, dated Sept. 9th, are the following further particulars:—

"M. Webb avait eu une attaque de goutte plus grave et plus longue que toutes les précédentes. Six semaines passées dans son lit l'avaient empêché de réaliser le double projet d'aller prendre les eaux de Vichy et de pousser ensuite jusqu'à Genève, pour faire une visite à son frère (l'Amiral Webb, R.N.). Il se remettait enfin peu à peu, et commençait à se tenir sur ses jambes, après avoir fait usage de béquilles. Déjà il pouvait monter sans secours jusqu'à son herbier; et comme la place y manquait pour des acquisitions nouvelles, il était occupé à déménager sa bibliothèque, qu'il transportait à l'étage inférieur, opération qui était déjà plus qu'à moitié effectivée, le classement méthodique des livres restant seul inachevé. Il en était là lorsque, le mardi, 29 Août, se montrèrent les symptômes d'une cholérine, qui pourtant fut bientôt arrêtée par les moyens usités en pareil cas. Le soir tout paraissait fini, mais la nuit fut sans sommeil; et le lendemain, mercredi, la fièvre survint, avec des embarras de tête, avec refroidissement sensible de la langue et des mains, c'est à dire avec des symptômes tout nouveaux et des plus alarmans. Un jeune médecin anglais était là; je ne sais ce qu'il fit, mais ce qu'il fit fut sans aucun succès, et lorsque j'arrivais sur les neuf heures du soir avec le docteur Cosson, déjà le malade avait perdu toute connaissance; il ne reconnaissait plus personne, et les deux médecins présens avaient perdu tout espoir, bien qu'ils administrassent encore des potions et qu'ils applicassent encore des sinapismes. A minuit le malade était dans un état pis encore. A deux heures et demie du matin il avait cessé de vivre; il s'était éteint sans agonie et presque sans souffrance. Vous ai-je parlé de choléra? Si je l'ai fait, c'est par erreur, car

il n'est pas possible d'appeler de ce nom une maladie dans laquelle il n'y a eu ni crampes, ni période cyanique, ni refroidissement général, ni altération des traits. Je croirais plutôt à une goutte remontée et compliquée de fièvre typhoïde, le tout aggravé par l'influence cholérique agissant sur un corps affaibli par un régime débilitant de plusieurs semaines."

A postscript again, to this letter, gives "les termes techniques dans lesquels on peut parler de la maladie qui l'a emporté."—"A la suite d'une attaque de goutte qui a duré deux mois, M. Webb a été atteint d'une gastro-entérite, accompagnée de quelques symptômes cholériques et typhoïdes, à laquelle il a succombé le 31 Août, 1854."

Mr. Webb, though of late years his principal residence was in an excellent mansion in the Avenue Marbœuf, Paris, where, like Humboldt, he found facilities for carrying on expensive scientific publications, not to be enjoyed elsewhere, was a native of England, and born on his paternal estate, Milford House*, Surrey. His father was the grandson of Philip Carteret Webb†, of Busbridge, Esq., one of the most distinguished antiquaries and lawyers of the day; and in the same way as the descendant has adorned the grounds at Milford House with numerous rare exotic trees, so did his ancestor beautify and improve Busbridge with oaks, and that to such an extent, that a silver medal from the Society of Arts was awarded to him, for having planted so great a quantity of acorns for timber. What Mr. Philip Carteret Webb was as an antiquary and lawyer, his great-grandson became as a classical scholar and Botanist. He was born in July 1793, and first went to Dr. Moore's celebrated school, thence to Harrow, and afterwards to Christ Church, Oxford, where he took a first-class in 1815.

Thus possessed of excellent talents, born to a good estate, and full of

* Now the property of his next brother, Colonel Webb, long Aide-de-camp to Lord Combermere.

† This gentleman, who was born in 1700, and died at Busbridge in 1770, is stated to have been eminently learned in the Records of this Kingdom, and particularly able as a parliamentary and constitutional Lawyer. He was twice returned Member of Parliament for the borough of Haslemere, and was a principal actor in the prosecution of Mr. Wilkes for his writings in the 'North Briton.' At his decease his library, and collections, principally of coins and medals, were sold; the sale of them occupying many days. The House of Peers purchased thirty MS. volumes of the Rolls of Parliament; and the British Museum is now in possession of his MS. on paper, which had been purchased by the Marquis of Lansdowne. His publications were numerous. See Nichols's 'Literary Anecdotes,' and the 'Biographical Dictionary,' for further particulars of this learned man.

ardour in pursuit of science, it is no wonder that he attained a high rank, both as a naturalist and as an author. He early set out on his travels, with a mind deeply imbued with Greek, Latin, French, Spanish, and above all Italian Literature. We are assured by a near relative of his, that he has been known at his own table to address different guests in seven different languages. The first of his works that has come to our knowledge was almost entirely classical, in Italian, entitled "Osservazioni intorno allo stato antico e presente dell' agro Trojano, del Signor Filippo Barker Webb, Gentiluomo Inglese, Membro dell' Università di Oxford, della Società Linneana di Londra, della Società Geologica, di quella dell' Orticoltura, etc. Milano, 1821." The fifth chapter has eighteen pages (8vo), all devoted to the physical condition of the Troad; and there are some learned discussions on Homeric Botany, and a treatise entitled "Necessità per un commentatore o filologo Omerico di conoscere la Botanica." At an after period, namely in 1844, the author published a French edition of this work, with corrections and additions, and some new plates. Italy, Greece, Asia Minor, Spain, Portugal, the North of Africa (Marocco), Madeira, and more especially the Canary Islands, were successively the objects of his travels and research. The latter country (the Canaries) detained him two entire years; and from that time to within a year or two of his death, he and M. Berthelot, the companion of his travels there and indeed the explorer of the whole group of islands during a period of twelve years, devoted the main portion of their lives to the illustration of the Civil and Natural History of this remarkable country*. The result is before the public in what are termed three volumes, large 4to, (but which in reality require to be bound in eight volumes,) with numerous maps and plates, and an Atlas "des cartes phytostatiques." It is, indeed, one of the most remarkable publications of the present day. The ablest artists were employed to execute the drawings and the plates; and the work is divided in the following manner:—

Tom. I. P. 1. Ethnographie et les Annales de la Conquête; with sixty plates, representing scenery, natives, etc. Part II. Miscellanées Canariennes; viz. Relation de Voyage, Chasses, Navigations, Caravanes, Notices, Episodes, Descriptions, remarques et observations diverses.

* "Histoire Naturelle des Isles Canaries; par MM. P. Barker Webb et Sabin Berthelot, Membres de plusieurs Académies et Sociétés savantes: ouvrage publié sous les auspices de M. Guizot, Ministre de l'Instruction publique."

Tom. II. P. 1. La Géographie descriptive; La statistique de la Géologie. Part II. La Zoologie, with numerous plates; many coloured."

Tom. III. P. 1. La Géographie Botanique. Part II. Phytographia Canariensis. This indeed comprises the "Flora" of the Canary Islands, and forms three sections (in fact, so many stout volumes), with nearly three hundred well executed botanical plates, and elaborate descriptions and remarks, entirely in Latin; exclusive of the "Plantæ Cellulares" (by Dr. Montagne), which appear in a separate volume, with nine plates, each containing several species.

The Atlas of phytostatic plates we have alluded to above, is very interesting. Four different vegetable "Regions" are represented:— 1. The Region of Euphorbias. 2. That of the Ravines. 3. Region of Laurels and Forest Plants. 4. Region of Pines. Among the plates that represent the general habit in aspect (*facies*) of certain species, the most striking are the *Euphorbia Canariensis*, *piscatoria*, and *aphylla; Convolvulus floridus*, *Plocama pendula*, and *Kleinia nervifolia*, but above all the Dragon-tree (*Dracæna Draco*), in different ages of growth.

Although Mr. Webb's time and energies (and we know, too, his purse) were heavily taxed in the prosecution of this noble work, he yet found time for other botanical memoirs and publications: among these we may enumerate his "Iter Hispaniense, or a Synopsis of Plants collected in the Southern Provinces of Spain and in Portugal." "Observations sur le *Tamarix Gallica* de Linné. "On the Genus *Hemicrambe*." "Sur le genre *Retama*." "Sur les groupes des *Ulicinées*." "De *Dicheriantho*, Paronychiarum genere novo." "Otia Hispanica, seu Delectus Plantarum rariorium per Hispanias sponte nascentium," 40 plates, folio. "Spicilegia Gorgonea," a very important portion of our "Niger Flora." Various articles, original, and communications from Botanical travellers in distant lands, are given in our Botanical Journals. The last of his publications, and not the least important, and which was reviewed at p. 127 of our present volume, is entitled "Fragmenta Florulæ Æthiopico-Ægyptianæ, ex plantis præcipue ab Antonio Figaro, M.D., Museo I. R. Florentino, missis;" accompanied by beautiful figures.

But we should do little justice to Mr. Webb's memory, if we were to speak of him only as a Scholar, Historian, and Botanist. He was no less distinguished by his gentlemanly bearing, the urbanity of his manners, and his great patronage of literature, but especially of Botany. His fine Museum and Library were always accessible to the student and

to the man of Science; strangers were received with great hospitality; and no one did more for the promotion of Botany in others than did Mr. Webb, especially by the encouragement he gave to botanical collectors; and his pecuniary contributions on such occasions were both judicious and liberal. By such means, too, he added immensely to the stores of his own Herbarium, which, there can be no question, was second in France, as a private herbarium, only to that of M. Delessert, while his Botanical Library alone has been on good authority valued at 25,000 francs.

Such incessant labours in the cause of literature and science did not go unacknowledged. It is well known that His Majesty the present Emperor of the French, Louis Napoleon, assigned to him the Legion of Honour; and, as might be expected, the Spanish Sovereign was ready to do still higher honour to the historian of

"*L'Isola di Fortuna* ora vedete,
Di cui gran fama a voi, ma incerta, giunge."

Her Majesty Queen Isabella II. not only permitted the 'Otia Hispanica' to be dedicated to her, but was pleased to confer upon the author the Cross of the distinguished Order of Charles III., the first Order in Spain, after that given only to Princes of Spanish blood.

The whole of Mr. Webb's fine botanical collections, including Herbarium and Library, are bequeathed to the Grand Duke of Tuscany, and will consequently be removed to Florence. His own remains have been conveyed to England, and deposited at Milford.—*W. J. H.*

BOTANICAL INFORMATION.

Extract of a Letter from DR. HARVEY, *dated* Freemantle, West Australia, May 19, 1854.

I wrote you last from Cape Riche, in March, saying, among other things, that I had given up my trip to Perth and Freemantle. Afterwards I changed my mind, and set out, in a cart, from King George's Sound on April 2nd, and arrived at Perth on the 13th, where I was hospitably entertained for a week by Mr. Sanford, who was as kind as he could possibly be, and so continues. His position enabled him to

procure me several facilities for my work, etc.; and I have the free use of a boat for dredging, and of the Government House at Rottenest Island, where I move over on Monday, and where I mean to spend three or four weeks. Unfortunately I wrote to Mr. Sanford from the Sound, after I had given up all thoughts of coming, to re-ship my paper, etc., to Melbourne by the first ship; and it so happened that a ship offered *three days* before my arrival, and so the boxes and bales went off, for better for worse. I am obliged, therefore, to use any paper I can procure, and, by begging and buying, get along. Mr. Roe gave me some capital brown, and I have got cartridge from the Convict Establishment. Now I am here I find plenty to do on the shore, and mean to stay till July, returning to King George's Sound by the 1st of August, staying a month there, and leaving by the Peninsular and Oriental Steamer on the 1st of September, for Melbourne. Perhaps you could write to me in the despatch-bag to Melbourne, through Mr. Higgins, and the Governor will forward it where I may then be. I have been twice to Garden Island (a real marine garden for Algæ), and on my last excursion discovered two new species of *Martensia* (*Hemitrema*, R. Br.), which are so pretty that I enclose them. Do not lose them, as I have as yet very few specimens of either, and may not find them again. My *M. Brunonis* may be identical with the Natal species, which ought to be compared with it; the *M. denticulata* is easily known by its eroso-denticulate margin, as well as substance and habit. I have still another (*M. australis*, MS.), found at the Sound, but have not brought any specimen with me. At this rate of going, it may be a large genus before I get home. I have not yet found *Claudea*, or any new *network* genus; but my collection is daily growing in interest, from new species, and from finding many old ones in a better state of fruit than they have hitherto been known in. I am surprised, however, to find some Antarctic species (as *Delesseria crassinervia*), and several which we had previously only from Melbourne or Van Diemen's Land; so that I expect I shall find the Nereis of this continent much less diversified than I had expected. As yet I have only about two hundred species, and of several only a few specimens, or a solitary one.

Mr. Drummond paid me a visit when I was at Perth, and had much to speak of. He is looking very well,—a great-boned, brawny Scot, with snow-white hair and beard,—and as active as ever, and as enthusiastic in his pursuit as possible. He has several new genera, he tells

me, from the north, some very remarkable; and I have offered to describe them for him before I leave, and send you the MS., if he sends me specimens in time. He has given me one very remarkable Rutaceous plant, the stamens all united in a perfect tube, as fully so as in *Meliaceæ.* He speaks of a superb *Verticordia*, with crimson flowers as big as half-crowns; the bush so gorgeous, that his waggoner, when he went up, used to turn aside when he passed the plant, from admiration, lest he should injure it. Drummond himself picked it so greedily, that, when he came to sort his plunder at night, he found so much, that he made his bed of what remained after he had filled his papers! He told me of a very remarkable irritable movement, which he has noticed in the hairs of several annual *Compositæ*, which I am to look for when they spring up. As yet I have seen none of the annuals of this country, except their dead stems. On my road from the Sound I walked a good deal (as we rarely travelled more than thirty miles a day), and collected what I could. Very few plants, except shrubs, were in blossom, and much of the country had been burnt. I gathered flowers of *Hakea eucalyptoides*, of which I sent you seeds from Cape Riche, and now report that it is one of the handsomest of the genus. The flowers are crimson, in dense balls, with very long primrose-colour styles, spreading to all sides. I hope Smith may raise it, and that it may blossom. The shrub itself is very graceful. Mr. Sanford has got a box of Wooden Pears for you (*X. occidentale*), and will ask you to send some to our Dublin Gardens and keep a few for my museum: there are plenty for all. I have not seen the tree, which he describes as being a very splendid thing when in flower, and very sweet. Some of the *Hakeas* are very sweet, like Hawthorn, and they call them May-bushes here. *H. floribunda* is specially sweet.

Drummond wants me to pay him a visit "over the hills," at his place; but it would occupy a fortnight, and my time is too short to spare so long from my coast-work, for what would be merely a pleasure excursion. Before I get from this Colony I shall have been eight months in it, one of which will have been lost in locomotion, and another nearly lost at Cape Riche. My next location will be either at Port Faery, near Portland Bay, on the Melbourne coast, or (if I can get there) Kent Island, R. Brown's great *Fucus* locality. There is a large lighthouse establishment on the island, and I hope to get sent in a Government supply boat, and brought away again by the same, on its return; but

this is uncertain. I do not expect to reach Hobarton before Christmas, and that will, I suppose, be a good season for Port Davy,—fully late, I fear, except for the mountains. If it be not too expensive, I mean to visit that quarter for Joseph's sake as well as my own, and shall try and get Mr. Gunn to come with me. I find it nearly impossible to attend to both land and sea plants; the latter take so much time in washing, laying out, and changing, that my whole time is literally occupied, except at meals; and one day's walk sometimes takes me three days to put on paper, before I can take another walk. This is because I have to dry such a number of specimens of each kind for my seventy subscribers. If, therefore, Gunn do not come with me, either land or sea will be neglected.

If the *Algæ* part of the 'Flora Novæ Zelandiæ' be yet published, I wish Joseph would send it to me, if possible, through the Colonial Office despatch-bag, to either the Governor of Melbourne (to prefer), or New South Wales. Melbourne will be my head-quarters, from which I shall branch to Van Diemen's Land, and return there before going to Sydney: I go to Sydney to get passage for New Zealand, if I go there. At Melbourne there is a Peninsular and Oriental hulk moored, on which I can leave all the extra baggage I do not require, which is my reason for making it head-quarters.—I do not stop at Adelaide at all, from having over-stayed my time here, and because I have not heard very good reports of it.

W. H. Harvey.

Epipogium Gmelini, Rich., *a British Plant.*

We have just received the welcome intelligence (accompanied by recent specimens) that the very curious aphyllous Orchidaceous plant, *Epipogium Gmelini* of L. C. Richard (E. aphyllum, *Reichenbach;* Limodorum Epipogium, *Sw.;* Satyrium Epipogium, *Linn.*), has been added to the number of our British native plants. The discovery was communicated to me on the 9th of this month (September), by the Rev. W. Anderton Smith, of Tedstone, from the Rectory, Delamere, Bromyard: —"I am sure it will interest you to know that, a few weeks since, Mrs. Anderton Smith found a specimen of the *Epipogium Gmelini*, the first, I am told, that has been found in England. For some time we looked in vain for other specimens; but, on the 23rd ult., I was fortunate in

detecting a considerable mass of it. All were found at the foot of a very steep woody bank, close to a brook; the soil very wet and stiff. As the banks are very much trampled on at present (timber and faggots being drawn along), I decided on digging it up, and planting it in a similar spot in our own grounds."

We trust, with the assistance of a drawing made by Mrs. Anderton Smith, from the recent specimens, to give an accurate coloured figure in the 'Botanical Magazine,' of this rarity. Even upon the Continent it appears to be seldom met with. It was first gathered in Siberia, by Gmelin, who called it *Epipogium*. It has since been discovered in various alpine countries in the north and middle of Europe. Though not a conspicuous plant, its flowers are very elegant, and highly curious in structure.

NOTICES OF BOOKS.

SEEMANN, DR. BERTHOLD: *The* BOTANY *of the Voyage of H.M.S. Herald, etc. etc.* Fasc. 4, 5. 4to. London, 1853–4. Each with 10 plates.

This valuable work rather increases than diminishes in interest, as it proceeds. We briefly noticed the 3rd fasciculus in our last volume. The 4th and 5th have now appeared, in which the Flora of the Isthmus of Panama is continued. In the 4th fasciculus the author carries out his views of uniting *Turneraceæ* with *Passifloraceæ*, and figures (at Tab. 27) his new genus, "*Erblichia*," which tends to unite the two. Another fine new *Pentagonia* (Rubiaceæ), *P. Tinajita*, is figured; the second new species he has detected. A full history of the medicinal Guaco (*Mikania Guaco*, H.B.), so celebrated among the Indians for curing snake-bites, is given, and the accounts savour of the marvellous. It is, indeed, not a little remarkable, how in America, both North and South, the various species of *Eupatorineæ* (despised as they are in European practice) are esteemed for the cures of all manner of diseases which flesh is heir to: especially the "Bone-set" (*Eupatorium perfoliatum*) of the United States. At this moment, too, we receive from a well-informed gentleman of Jamaica, dried specimens of "*Eupatorium nervosum*, *E. villosum*, and *E. rigidum*," accompanied by

the assurance that it has been found an infallible cure for Cholera* !—*Crescentiaceæ* here forms an order distinct from *Bignoniaceæ*, including eight or nine Genera, accompanied by a beautiful figure of *Parmentiera cerifera*, of this Order. Some fine figures of *Piperaceæ* appear, especially the *Artanthe imperialis*, Miq.

The descriptive matter does not go beyond the last-mentioned family, but the remaining plates in Fasc. 5 are of highly interesting subjects. Tab. 43. *Zamia Chigua*, Seem. Tab. 44. *Cypripedium Hartwegi*, Reichenb. fil. Tab. 45 and 46–47 (a folio plate) are devoted to admirable illustrations of the "Vegetable Ivory," *Phytelephas macrocarpa*. The remaining three plates are devoted to Ferns:—Tab. 48, *Ctenopteris* (Glyphotænium) *crispa*, J. Sm.; Tab. 49, *Phegopteris Seemanni*, J. Sm; Tab. 50, *Nephrodium Cumingianum*, J. Sm.

PARLATORE, FILIPPO; *Viaggio per le Parti* SETTENTRIONALI DI EUROPA, *fatto nell' anno* 1851. Parte Prima: Narrazione del Viaggio, con una carta Geographica in rame. Firenze, 1854.

The Travels of an enlightened Italian in the extreme north of Europe, even to Cape North, cannot but be interesting to any ordinary reader. Here, in addition, we have in the author a Naturalist, a most able Botanist, and a close observer of men and manners, as well of plants. Some particulars of this journey are given in the fourth volume of this Journal, in a letter from Professor Parlatore, addressed to the late P. B. Webb, Esq. An excellent Map accompanies the work.

SCHUCKARDT, TH.: *Synopsis* TREMANDREARUM, *Dissertatio inauguralis, etc.* 4to. Gottingæ, 1852.

The natural family of *Tremandreæ*, Br., is here fully considered under the following heads:—1. Essential or differential character; 2. Natural character; 3. Affinities; 4. Region; 5. Discovery; 6. Conspectus; 7. Genera and species. *Tetratheca*, Sm., contains 22 species; *Platytheca*, Steetz, 2 species; and *Tremandra*, 2.

* Pereira tells us the properties are "bitter tonics." The *Mikania Guaco*, it should be here observed, is stated by Pereira to have been used in cholera. It contains a "peculiar resin; but that, if it possesses any peculiar therapeutical virtues, they have been monstrously exaggerated."

On the North Brazilian EUPHORBIACEÆ *in the collections of* Mr. Spruce; *by* GEORGE BENTHAM, ESQ.

PEDILANTHES.

This genus, hitherto confined to the West Indies, Mexico, and the Spanish Main, had not been found within the limits of Brazil, till Mr. Spruce gathered the following species in April, 1851, in the Capoeiras, near Barra do Rio Negro. It is allied to the common *P. tithymaloides*, but the leaves are much less carinate, shorter, and broader, and the shape of the involucre is different, although difficult to describe.

P. *retusa;* glabra, foliis oblique lato-ovatis obtusis retusisve basi acutis leviter carinatis, involucris postice leviter gibbis, labio superiore brevi lato integro, inferiore duplo longiore, ovario glabro, capsulis ecornutis.—*Caules* a basi perenni plures erecti carnoso-sublignosi, subramosi, 2–5-pedales, glabri. *Folia* glabra, crassiuscula, fere *Loranthi*, 2–2½ poll. longa, 1–2 poll. lata, pleraque apice emarginato-retusa, præter costam mediam subavenia, petiolo brevissimo. *Flores* in cymam terminalem brevem vix ramosam dispositi. *Involucra* breviter pedicellata, calceiformia, 4–5 lin. longa, postice leviter gibba nec calcarata et intus biglandulosa, ore bilabiato, labio superiore v. postico erecto apice inflexo truncato, inferiore horizontaliter producto subcylindrico flores involvente 4-lobo, lobis 2 inferioribus majoribus subtus alte connatis apice rotundatis 2 superioribus subinclusis et iis dimidio minoribus angustioribusque. *Flores masculi* 15–20, monandri, squamis nullis intermixtis. *Pediculi* ex involucro subexserti, superne hispidi. *Filamentum* in pediculo articulatum, glaberrimum, breve; antheræ loculi distincti. *Flos fœmineus* cum pediculo hirtello continuus, ovario styloque elongato glabris. *Styli* rami breves, bifidi. *Capsula* lævis, trisulca, tricocca.

EUPHORBIA.

The collection only contains four species, all common tropical weeds, and all gathered in the neighbourhood of Santarem, viz. *E. geniculata*, Ort. (*E. prunifolia*, Jacq.), *E. hypericifolia*, L., *E. pilulifera*, L., and one of the *Chamæsyce* set, perhaps *E. tenella*, H. B. K.; but without a thorough revision of the numerous good or bad species published in

various works, it is impossible to determine these little annuals with accuracy.

Dalechampia.

The Santarem plant distributed as possibly a new species, proves to be a mere variety of the common *D. scandens*, Linn., or *D. Brasiliensis*, Lam., to which should probably be referred *D. sidæfolia*, H. B. K., and some others. Mr. Spruce gathered also another common species, *D. convolvuloides*, Lam., at Barra do Rio Negro. He did not meet with the curious and somewhat anomalous *D. micrantha*, Pœpp., but we have it in the last Guiana collections of the two Schomburgks (Rob. Schomb. n. 784; Rich. Schomb. n. 1430).

Peridium.

The small tribe of *Euphorbiaceæ*, to which Dr. Klotzsch has given the long and somewhat inconvenient name of *Prosopidoclineæ*, is divided by him into four genera, so closely allied to each other, that he might well have left them united under the name of *Pera*, selected by Mutis, probably in allusion to the pear-shaped fruit of his original species. I have not, it is true, seen the male flowers of Mutis's plant, and I do not quite understand the character given of them by Klotzsch; and it must be admitted that the columnar andrœcium of *Schismatopera*, although it separates but a single species, is a character which is in *Euphorbiaceæ* generally considered as sufficient for generic distinction. I do not therefore venture, without a more careful study of some of the older species than my present materials enable me to make, now to propose their entire re-union, but at least I cannot distinguish *Spixia* from *Peridium*. In all the species I have examined (including most of Klotzsch's), the stamens of each male involucre are separated into two or three distinct flowers by calyxes, which, as the stamens enlarge, become irregularly split, so as to assume the appearance of mere scales or bracts. These calyxes, called *calyces bi-tri-partiti*, in the character of *Spixia*, and *squamulæ membranaceæ* in that of *Pera*, vary much in length, but are never entirely wanting in any species of *Peridium* I have seen. They are mentioned also in Klotzsch's character of *Peridium*, in his account of Schomburgk's *Euphorbiaceæ* (Lond. Journ. Bot. vol. ii. p. 44), but omitted in the detailed character, as well as in the analytical figure, in his review of South American Euphorbiaceous genera, in Ericson's 'Archiv.' The rudiments of female flowers in the

male involucres, another supposed distinctive character of *Spixia*, are present or absent in different involucres of the same species of *Peridium*. I have particularly observed this in an unpublished Guiana species, which bears in some herbaria the name of *P. Schomburgkianum*, Kl. (Rob. Schomb. last coll. n. 580 and 594, Rich. Schomb. n. 901 and 905). In one male involucre I found two male flowers, and one abortive female; in another, three males and two abortive females; in two others, three males in each, without any rudimentary females. The stamen varied from two to five in each flower, but always more in the central one than in the two lateral ones. In all, the calyx was nearly as long as the filaments.

The species contained in Mr. Spruce's collections are:—

1. *P. oblongifolium*, from Caripi, described p. 243 of the second volume of this Journal.

2. *P. bicolor*, Kl. in Lond. Journ. Bot. vol. ii. p. 44. Of this species, Spruce, as well as Schomburgk, gathered two very distinct varieties, which one would have been tempted to consider as species, but that there appear to be no really constant characters to distinguish them, viz. *α*, *tomentosum*, foliis supra opacis v. vix nitidis subtus tomento brevi molli squamisque lepidotis canescentibus, a tree of 14 to 16 feet; British Guiana, *Schomburgk*, first coll. n. 114, and in the Capoeiras, near Barra do Rio Negro, *Spruce;* and *β*, *nitidum*, foliis coriaceis supra nitidis subtus squamellis minutis lepidoto-canescentibus v. flavicantibus et glandulis minutis punctatis; British Guiana, *Rob. Schomburgk*, second coll. n. 685 and 686, *Rich. Schomburgk*, n. 1070 and 1071; and Obidos, on the Rio Negro, *Spruce*. The calyxes are very distinct in both varieties. The involucres are white or cream-coloured when fresh.

3. *P. coccineum*, sp. n.; foliis longiuscule petiolatis oblongis subacuminatis coriaceis nitidis novellis subtus parce lepidotis demum glabratis, involucris masculis globosis, filamentis crassis oblongis, involucris fœmineis 6–8-floris, capsulis globosis crassis tomentosis.—*Frutex* 15–20-pedalis v. arbor parva. *Folia* fere *P. glabrati*, 3–5-pollicaria, basi cuneata. *Pedicelli* aggregati, petiolo breviores, apice subincrassati, bracteis 2 oppositis ovato-rotundatis concavis carinatis, majore fere lineam longa. *Involucra* extus lepidota, in vivo coccinea, mascula globosa, triflora, flore medio 4–5-andro, lateralibus 2–3-andris. *Calyx* staminibus paullo brevior, membranaceus, irregulariter dentatus v. fissus. *Antheræ* biloculares, loculis reflexis in fila-

mentum crassum ovoideo-oblongum. *Involucra* fœminea per anthesin obovoidea. *Ovaria* in quoque involucro sæpius 8, tomentosa, stigmate trilobo. *Capsula* 5 lin. diametro, trivalvis, valvulis demum bifidis.

Gathered by Mr. Spruce, on the shores of the Lago de Obidos, and distributed as *Peridium*, n. 2; it much resembles at first sight the *P. glabratum* of Schott, but the filaments of the males, the number of flowers in the female involucres, as well as the shape and texture of the capsules, readily distinguish it. The fresh involucres are of a bright vermilion, somewhat yellow at the base. The flowers emit a sweet smell of honey.

SCHISMATOPERA.

In Mr. Spruce's first Barra collection I distributed a species of this genus as new, under the name of *S. laurina;* but numerous specimens, subsequently received, have shown that it does not differ essentially from the original *S. distichophylla*, Kl., from Guiana, the only species known to me. It is a small tree or shrub, apparently not uncommon in the forest near Barra do Rio Negro. Specimens were also brought to Mr. Spruce by the natives of the Rio Uaupés.

MAPROUNEA.

The *M. Guianensis*, Aubl., is a widely distributed shrub or tree, and varies considerably in the shape of the leaves, sometimes sharply acuminate, sometimes broad and blunt, but never so much so as in the more southern *M. Brasiliensis*, St. Hil., which latter is likewise always to be distinguished by the almost sessile female flowers. In *M. Guianensis* they vary in number, from one to three or four below each male amentum, but they are always borne on rather long pedicels. Mr. Spruce gathered the *M. Guianensis* on the shores of the Amazon, near Santarem, in July, 1850, in the gapó of an igarapé, near Barra do Rio Negro, in May, 1851, and on a campo near the falls of San Gabriel, in April, 1852. I have specimens also from British Guiana (Rob. Schomburgk, 2nd coll. n. 638, Rich. Schomb. n. 1059), Surinam (Hostmann, n. 996), Brazil, prov. Bahia (Blanchet, n. 2725), prov. Ceara (Gardner, n. 1836), and Peru (Matthews, n. 1654).

GYMNANTHES.

The American, and especially the Brazilian species, allied to *Excœ-*

caria, are numerous, and have been distributed into a number of genera, upon characters so minute, that when a new one presents itself, it is a great chance if it will be found to fit into any of them. Thus it is with the only species contained in Mr. Spruce's collection. In foliage it comes nearest to the *Gussonia discolor;* in character it is very near to *Gussonia*, *Sebastiania*, *Dactylostemon*, and especially to *Gymnanthes*, although it differs from that genus, as limited by Klotzsch, in that it is only the central flowers (or bundle of stamens) of each bract that has a small scale at the ramification of the filament. I have not either been able to find any female flowers in the specimens before me, so that the plant may be diœcious. I cannot, however, on such slight grounds, propose a new genus for its reception, and therefore place it in *Gymnanthes*, to which it comes nearest, and which, being the oldest name, would be the one adopted, should several of these closely-allied genera be re-united into one. This new *G. hypoleuca* was found by Mr. Spruce, growing commonly on the banks of the upper Rio Negro, between San Joaquim and San Carlos, and also on the Rio Uaupés. The following are its characters:—

G. hypoleuca, sp. n.; foliis elliptico- v. lanceolato-oblongis supra glabris subtus albidis, spicis masculis pluribus confertis petiolo vix longioribus, squamis trifloris, flore medio triandro sub ramificatione squamellato, lateralibus diandris nudis.—*Arbor* 18-pedalis, ramulis tenuibus griseis. *Folia* 3–5 poll. longa, 1–2 poll. lata, acuminata, integerrima, basi acuta, chartacea, penninervia, subtus tomento minutissimo pulveraceo albicantia et glandulis maculæformibus paucis præsertim basi conspersa, petiolo 3–4 lin. longo. *Spicæ masculæ* in quoque axilla 3–6, sessiles, glabræ, squamis parvis latis concavis. *Filamenta* graciliora et antheræ minores quam in *G. lucida*. *Flores fœmineos* non vidi.

MICROSTACHYS, *A. Juss.* (*Cnemidostachys*, Mart.)

Mr. Spruce has two species of this genus; the one from Santarem, distributed as new, may possibly be a mere variety of the *M. crotonoides*, Kl. (*Cnemidostachys crotonoides*, Mart.), which appears to be a rather widely diffused and variable species. It is a slender dichotomous shrub or under-shrub, of five or six feet in height. The other one, an erect annual from the waste grounds near Pará (but not gathered in sufficient quantity for general distribution), is allied to the *M. Guianensis*,

Kl. (which may be the original *Microstachys*, or *Tragia corniculata*, Vahl), but the leaves are narrow lanceolate, instead of ovate cordate, and it is remarkable for its small capsules, as well as for the very minute and short male spikes. I should therefore propose it as new, with the following diagnosis :—

M. micrantha, sp. n.; annua, erecta, pubescens, foliis lanceolatis subintegerrimis, spicis masculis minutis ovatis, capsulis parvis pilosulis parce muricatis.—*Caulis* pedalis, parce ramosus. *Folia* brevissime petiolata, vix pollicaria, acutiuscula, basi rotundata, oculo nudo integerrima, sub lente minutissime glanduloso-crenulata, pilis brevibus sparsis utrinque puberula. *Spicæ masculæ* breviter pedicellatæ, vix semilineam longæ, 3–4-floræ. *Flores* solitarii, squama bracteante minuta 3–5-dentata. *Sepala* 3, late cuneata, truncata, colorata. *Stamina* 3, sepala æquantia. *Flos fœmineus* in eadem axilla v. sæpius in axilla diversa solitarius, sessilis. *Capsula* linea paullo longior, coccis apice bimuricatis et sæpe basi aculeis paucis brevibus v. tuberculis munitis.

Hura.

If the three published species of this genus are really distinct, the one gathered by Mr. Spruce, on the south bank of the Amazon, opposite Monte Alegre, would, according to the short diagnosis given, belong to the *H. Brasiliensis*, Willd., as the leaves are rather truncate at the base, than distinctly cordate, as in the common *H. crepitans*. The male amenta are however, in all the specimens of *Hura* I have seen, oblong, and the leaves can never be said to be "æqualiter serrata," so that it is probable that both this and *H. strepens* should be re-united to *H. crepitans*. Our plant is called *Assacú* by the Brazilians, according to Mr. Spruce.

Sapium.

Mr. Spruce gathered the broad-leaved *S. Hippomane*, Mey., in the forest at San Gabriel, forming a tree of 70 feet, and the narrow-leaved *S. prunifolium*, Kl. (from which I cannot distinguish *H. serratum*, Kl.), as a shrub of 12 feet, at Obidos, on the Amazon. There are also leaves only of a small tree, which Mr. Spruce met with occasionally near Santarem, but never in flower. From the petiolar glands it would appear to be a *Sapium*, and, if so, a new species, with the long narrow leaves beautifully fringed with short regular cilia, proceeding from the serratures.

Omphalea.

Specimens of the *O. diandra*, Aubl., a woody climber, were gathered at the junction of the Solimões and Rio Negro, in May 1851.

Leptorhachis.

I have not seen the *L. hastata*, upon which Dr. Klotzsch founded this genus, and know not from what part of Brazil he had it; but a single specimen in fruit of an herbaceous twiner, gathered by Mr. Spruce at Barra do Rio Negro, agrees as far as it goes with the character given.

Astrococcus, gen. nov. *Acalyphearum*.

The plant for which I propose this new genus has much of the habit as well as the male flowers and the female stigmate of *Botryanthe*, and I was at first disposed to consider it only as a very marked species of that genus; but the female flowers in other respects, and the fruit, are too different to allow of their combination without uniting them also with other neighbouring genera admitted to be distinct.

Char. Gen. Astrococcus. *Flores* apetali, monoici, racemosi, singuli bractea suffulti. *Fl. Masc. Calyx* globosus, 4-partitus, laciniis æstivatione valvatis. *Stamina* 6–8, filamentis brevibus crassis basi in discum depressum coalitis, antheris bilocularibus. *Fl. Fœm. Calyx* 4-partitus, laciniis angustis recurvis. *Ovarium* sessile, depressum, trilobum, lobis dorso muricatis, triloculare, ovulis solitariis pendulis. *Stylus* ovoideus, crassus, ovario longior, apice concavus, stigmatibus 3 brevissimis dentatis. *Capsula* tricocca, coccis horizontaliter divergentibus clavatis 2–4-cornutis muricatisque intus bivalvibus.

Species unica: *A. cornutus. Arbor* gracilis, 10–12-pedalis, ramulis pubescentibus. *Stipulæ* minutæ setaceæ v. nullæ. *Folia* breviter petiolata, oblonga, acuminata, 4–6-pollicaria, serrata, serraturis sæpe glanduliferis, basi angustata, ad petiolum obtusa v. emarginata, membranacea, penninervia, pube brevi conspersa præsertim ad venas et in pagina inferiore. *Racemi* axillares v. supra-axillares, simplices, folio breviores. *Flores fœminei* cum masculis in parte inferiore mixti, superiores omnes masculi v. flos terminalis interdum fœmineus; omnes parvi, breviter pedicellati, bractea parva lineari fulti. *Calyx* marium expansus, lineam latus, extus pubescens. *Stylus* fœmineorum lineam longus, primo intuitu ovarium simulat. *Ovarium* ipsum sub stylo

per anthesin fere reconditum, post anthesin cocci mox radiatim excrescunt, maturi basi attenuati, fere 3 lin. longi, virides, apice armati spinis rubris sæpe in cornua incrassatis. *Semen* ovoideum. *Albumen* carnosum. *Embryo* vix albumine brevior, cotyledonibus ovatis planis, radicula brevi.

From the gapó of the Rio Negro, above the falls of San Gabriel, *Spruce*.

ANGOSTYLES, gen. nov. *Acalyphearum*.

This tree is again in some respects allied to the last, and to *Botryanthe*, but the inflorescence as well as the flowers differ too much to associate them in the same genus. The green urn-shaped style, half an inch long, is a very striking feature in the female flower.

Char. Gen. ANGOSTYLES. *Flores* monoici, apetali. *Masculi* secus ramos pedicellati, solitarii v. fasciculati. *Calyx* valvatim 3–4-partitus. *Stamina* plurima; filamenta brevia, basi in columnam pyramidatam coalita, antheris ovatis bilocularibus. *Flores fœminei* axillares v. terminales, solitarii, pedicellati. *Calyx* 5-partitus, laciniis angustis. *Ovarium* sessile, subglobosum, triloculare, loculis uniovulatis. *Stylus* maximus, infundibularis, apice subrecurvo-6-lobus. *Capsula* profunde trisulca, tricocca, stylo persistente coronata, coccis intus bivalvibus.

Species unica: *A. longifolia.* *Arbor* gracilis, 15–20-pedalis, ramulis crassiusculis novellis ferrugineo-pubescentibus. *Stipulæ* subulatæ. *Folia* ad apices ramulorum approximata, subsessilia, elongato-cuneata v. obovali-oblonga, 1–1½-pedalia, acuminata, remote glanduloso-serrulata, basi longe angustata, membranacea, ad venas pubescentia, cæterum glabra. *Flores masculi* e ramulis annotinis vetustioribusve nati, flavi, pedicellis tenuibus 3–5 lin. longis, solitariis v. per 2–5 fasciculatis subracemosis. *Sepala* ovata, 2 lin. longa, crassiuscula, extus tomentella. *Stamina* 20–25, calyce breviore, filamentis breviter liberis pilis intermixtis. *Fl. fœminei* pedicello rigido 4–5-lineari impositi. *Stylus* crassus, viridis, tomentellus, 4–6 lin. longus. *Capsula* 4–5 lin. diametro, profunde trisulca, tomentella, coccis dorso plus minus sed semper molliter et breviter muricatis. *Semina* fere globosa, magnitudine pisi minoris.

Gathered by Mr. Spruce in the forest near San Gabriel, on the Rio Negro.

Acalypha.

There are but three species of this numerous genus in the collection. One is the common *A. alopecuroidea*, Jacq., a weed in the cultivated grounds on the Amazon, between Santarem and Barra, the two others appear to be unpublished. Both are said by Mr. Spruce to be suffrutescent climbers of twelve to twenty feet long, a habit which I do not find ascribed to any other species but the *A. Carthagensis*, Jacq., which is said to be *sarmentose*. This is, however, a character of which dried specimens seldom give any indication, and can only be ascertained from collectors' notes.

1. A. scandens, *Spruce*, pl. exs.; suffruticosa, ramis sarmentosis pubescentibus, foliis longe petiolatis amplis cordato-oblongis acuminatis crenatis sparse piloso-hispidis v. demum glabratis scabro-punctatis, spicis axillaribus superioribus masculis inferioribus fœmineis longissimis, bracteis per anthesin minutis, stylis longe plumosis.—*Caules* 15–20-pedales, superne leviter angulati, pube brevi scabri. *Stipulæ* lanceolato-subulatæ, pilosæ. *Folia* semipedalia v. longiora, acuminata, herbacea, viridia, punctis minutis præsertim in pagina inferiore scabra, pilis rigidis supra sparsis subtus præsertim secus venas dispositis, penninervia et basi sub-5-nervia, petiolo 2–4-pollicari, basi breviter contracto et demum indurato ad dilatationem subarticulato. *Spicæ* pilis flavidis hispidæ, suberectæ, in axillis solitariæ, graciles; masculæ superiores, semipedales, floribus crebris; fasciculi 5–8-flori, bracteis 2–3 minimis subtensi, flores singuli pedicellati, minuti, 6–8-andri. *Spicæ fœmineæ* 1–1½-pedales, floribus parvis sessilibus; bracteæ subtendentes minutissimæ v. omnino inconspicuæ; ovarium pilis flavidis hirsutissimum; styli 3–5 lin. longi, plumoso-multifidi, coccinei.

On the islands of the Amazon opposite Santarem, *R. Spruce*. Apparently a variety of the same species was gathered in Surinam by Hostmann (n. 990). It is less hispid, and the leaves are still larger. The flowers are the same, but, as the fruit advances towards maturity, the subtending bract grows out, as in most *Acalyphæ*, to a broad reniform crenate involucre, as long as the fruit itself.

2. *A. acuminata*, sp. n.; suffruticosa, ramis sarmentosis puberulis, foliis breviter petiolatis oblongis acuminatis remote calloso-serratis basi cuneatis ad venas hirtellis scabro-punctatis, spicis axillaribus elon-

gatis inferioribus masculis reflexis superioribus fœmineis erectis, bracteis parvis acute dentatis, stylis longe plumosis.—Affinis ex descriptione *A. cuneatæ*, Pœpp. et Endl. *Folia* 6–8 poll. longa, 2–2½ poll. lata, acumine longo obtuso, basi acuta nec cordata, membranacea, utrinque viridia, penninervia. *Spicæ masculæ* folio suo breviores, fere glabræ, tenues, crebrifloræ; *fœmineæ* folia superantes, floribundæ. *Bracteæ* 2–3-floræ, per anthesin minutæ, fructiferæ raro capsulam superantes, ovatæ, acutæ, grosse et acute dentatæ. *Styli* rami coccinei. *Capsulæ* pilis paucis rigidis hispidæ.

In the Gapó at Managuiry, at the mouth of the Rio Negro, *R. Spruce.*

Alchornea.

This genus now includes a considerable number of species, chiefly South American, which may be easily distributed into two sections by the venation of the leaves. It is nearly allied to *Conceveiba* and *Aparisthmium*, but appears to be always distinguished by the octandrous flowers of the males, and the two long styles of the females. Mr. Spruce's collection contains the following three species.

§ 1. *Foliis penninerviis.*

1. A. *castaneæfolia*, Mart. in Flora, 1841, vol. ii. Beibl. p. 32.—*Hermesia castaneæfolia*, Humb. et Bonpl.—A shrub of 8–15 feet, frequent along the Amazon, growing with the *Salix Humboldtiana.*

2. A. *Schomburgkii*, Kl. in Lond. Journ. Bot. vol. ii. p. 46.—A small tree, with spreading, almost climbing branches, gathered by Spruce at Obidos, in the Sierra de Mapirí, and in the marshy campos near Santarem, in the Capoeiras at Barra do Rio Negro, and in the Capoeiras and Caatingas of the Rio Uaupés; and by Gardner on the Rio Preto, in the province of Pernambuco (n. 2993). Some female specimens from a large tree in the forest near Barra, differ slightly in the surface of the leaves, the petioles and young branches being more decidedly canescent, and in the female calyxes longer and more pointed; but there are no male specimens, to enable us to judge whether it be anything more than a mere variety.

§ 2. *Foliis basi trinerviis.*

3. A. *glandulosa*, Pœpp. et Endl. Nov. Gen. et Sp. vol. iii. p. 18. t. 221. var.? *parvifolia.*—In the Capoeiras, near San Gabriel, forming a

tree of from 20 to 60 feet, and var.? *floribunda*, a tree of 60 feet, in the woods of the Rio Uaupés.

Without actual comparison with Pœppig's specimens, I cannot feel certain that these two varieties belong to his species. He describes his leaves as much larger (attaining the size of 8 inches by 5), but those represented in his plate are not half that size; in our var. *parvifolia*, they are not above 3 inches by 2. They are almost coriaceous, sometimes glabrous, sometimes pubescent underneath, the glands at the base are from two to five, and there are but few or none of those large spot-like glands scattered over the under face of the leaf which may be observed in several *Alchorneæ*. The male spikes are sometimes branched, more frequently simple, but growing several together from each axil. In our var. *floribunda*, the leaves are larger, reaching to 5 inches by 3, entire or with minute and remote glandular teeth, and there are generally several large, brown, smooth, spot-like glands, irregularly scattered over the under surface, which is glabrous. The male spikes are numerous and slender, generally simple. This last may possibly be a distinct species, but I cannot characterize it without having seen the females.

Gardner's n. 5611, from Rio Janeiro, is the *A. Iricurana*, Casar., or *A. erythrosperma*, Kl. No. 5610 and 5612, of the same collection, appear to belong to a very common Rio Janeiro species, published by Martius in 1841, under the name of *A. nemoralis*, and by Casaretto in 1842, under that of *A. Janeirensis*, and since then subdivided by Klotzsch into three: *A. psilorhachis*, *A. intermedia*, and *A. parvifolia*.

Conceveiba.

Two or three specimens, in fruit, of the true *C. Guianensis*, of Aublet, were gathered by Mr. Spruce, near Barra do Rio Negro; and the Hookerian Herbarium contains female specimens in various stages of flower and fruit, from Cayenne and Demerara. I have seen no Guiana specimens of the male plant, nor was it known to Aublet, Richard, or Jussieu. Klotzsch indeed gives a character, derived from males of two species, but one of them at least belongs to *Aparisthmium*, Endl., which appears to differ sufficiently from the true *Conceveiba* to be adopted, especially if I am right in referring to the original *C. Guianensis* some male specimens gathered by Mr. Spruce in the Capoeiras near Panuré, on the Rio Uaupés. The foliage is precisely the same, the inflorescence is strictly terminal, as in the female, and the bracts have the same large

glands on each side. The flowers differ at once from those of *Aparisthmium* in the number of stamens, which are indefinite, and always more than twelve, instead of three only. These characters may be thus technically expressed :—

Conceveibæ Fl. masc. in paniculam ramosam terminalem dispositi, secus ramos divaricatos ad axillam bracteæ parvæ crasse biglandulosæ glomerati, sessiles v. brevissime pedicellati. *Calyx* valvatim 3–4-partitus. *Stamina* plurima (ultra 12) filamentis liberis v. vix basi coalitis calyce longioribus flexuosis, antheris parvis bilocularibus.

The Surinam plant of Hostmann's (n. 1261) referred by Steudel to the *C. Guianensis*, appears to be a distinct species (*C. Hostmanni*), differing in the shorter petioles, more shining leaves, less pointed and more cordate at the base, the more tomentose inflorescence, and especially by the style branched from the base, with the thick short branches closely appressed on the ovary, instead of being entire and erect to near half its length, as in *C. Guianensis*. The male of Hostmann's plant is unknown.

Some male specimens gathered by Mr. Spruce, in the Capoeiras at Panuré, on the Rio Uaupés, appear to belong to a third species, as follows :—

C. *latifolia*, sp. n.; foliis amplis ovatis obtusis v. vix acuminatis, floribus masculis 20–30-andris.—*Arbor* gracilis, 15-pedalis. *Ramuli* angulati et inflorescentiæ pubescentes. *Folia* forma fere *Aparisthmii macrophylli*, majora 11 poll. longa, 6 poll. lata, petiolo 3-pollicari, penninervia, venis 2 infimis ad basin folii oppositis, omnibus subtus prominentibus, consistentia rigide membranacea, subtus in vivo albido-purpurascentia in sicco rufescentia, utrinque præsertim ad venas pilis minimis conspersa. *Inflorescentia* mascula *C. Guianensis* terminalis ramosa. *Flores* glomerati ad axillam bracteæ parvæ biglandulosæ. *Calyces* globosi, valvatim 4-fidi. *Stamina* circa 30, filamentis quam in *C. Guianensi* brevioribus. *Flores fœminei* non visi.

There is a single female specimen of another plant, apparently allied to *Conceveiba*, but insufficient for description.

Aparisthmium.

This genus has the inflorescence of *Alchornea* and *Stipellaria*, but the male flowers have only three stamens instead of eight; the females are tricarpellary, as in *Stipellaria*, but the style is divided into three,

rather short and thick branches, very papillose, and almost plumose on the inner side, and emarginate at the extremity, whilst in the two other genera the divisions of the style are long, slender, acute, and entire.

I know of but one species of *Aparisthmium*, which has evidently a wide geographical range, and varies much in the degree of pubescence. The young leaves are densely tomentose in Sello's specimens, and but slightly so in most of the North Brazilian and Guiana ones, but I can find no other difference, at least in the males, for I have not the females of Sello's plant. I have some doubt as to its being identical with the original *A. cordatum*, a species not described it is true, but the leaves of ours are scarcely such as to justify the name of *cordatum;* I have therefore adopted that of *macrophyllum*, given to it by Martius and Klotzsch. It is a small tree. The leaves are large, as much as 10 inches by 6, ovate, acuminate, rounded or broadly but slightly cordate at the base, more or less pubescent when young, nearly glabrous when old. The flowering spikes are simple and axillary, the males 6–10 inches long, with the flowers nearly sessile, and many together in small bunches; the females singly pedicellate in racemes from 4 to 6 inches long. It is the n. 883 of Schomburgk's first Guiana collection, and was referred by Klotzsch (Lond. Journ. Bot. vol. ii. p. 46), by mistake, to the *Alchornea latifolia*, Hayne, but is not Swartz's plant of that name. It is also in Martius' Cayenne collection, in Blanchet's Bahia collection, n. 2318, and has been distributed among Sello's plants by the Berlin Herbarium, under the name of *Conceveiba macrophylla*, Kl. It appears to be also the *Alchornea macrophylla*, Mart., in Flora 1841, vol. ii. Beibl. p. 31. Mr. Spruce gathered it near Barra do Rio Negro and in the Capoeiras, near San Gabriel.

(*To be continued.*)

Extract of a Letter relating to VEGETABLE OILS, etc.; *from* RICHARD SPRUCE, ESQ.; *dated* San Carlos del Rio Negro, Venezuela, 19th March, 1854.

Vegetables yielding oil abound in this region, but with the present scanty population, and their listless, lazy habits, it is exceedingly difficult to get together even a small quantity of the oils, resins, etc., which in Europe would be so highly esteemed. Nearly all the palm-fruits

yield oil in greater or less quantity. You are aware that very pleasant drinks are prepared here by triturating the fruit of the Assai and other Palms in water, and adding a small quantity of sugar and farinha. The Portuguese give the name of "vinho" to these drinks, though totally different from the palm-wine prepared in other parts of tropical America (and I believe also of Asia). The Indian name is "yukissé," which is a general name for all sorts of vegetable juices, and also for the gravy of animal substances. All the Palm drinks are exceedingly nutritive, and several are slightly purgative, owing, no doubt, to the oil they contain. By allowing the yukissé to stand a short time in a cuya, the oil rises to the top, and an idea is obtained of the quantity yielded by any particular palm-fruit. Of all that I have seen, the *Caiaué* (*Elais melanococca*, an actual congener of the African Palm) yields oil in the greatest quantity, and in appearance exactly like the oil of *E. Guineensis*; but I have never heard of its being collected, and put to any use. The Caiaué palm is abundant all about the mouths of the Rio Negro and Madeira, but I have not seen or heard of it anywhere up the Rio Negro. I sent you a spadix with fruit from the Barra do Rio Negro. Why it was called "*melanococca*" is hard to say, for the fruit is of a bright vermilion colour. Perhaps Gærtner had only the nut.

After the Caiaué, as to quantity of oil, come the various species of *Œnocarpus* (*Œ. Bacaba*, *Batana*, *disticha*, etc.). The oil of these is apparently of finer quality than that of Caiaué; it is colourless and sweet-tasted, and not only excellent for lamps, but for cooking. The shopkeepers of Pará buy Patana-oil of the Indians, and mix it in equal proportions with olive-oil, retailing the whole as "olive-oil," from which, indeed, even the best judges can scarcely distinguish it. I can bear testimony that, for frying fish, oil of Baccaba is equal either to olive-oil or butter. The various species of *Œnocarpus* abound on the Amazon and Orinoco, and on their tributaries. I have lately seen the Patana in the greatest plenty throughout the Casiquiare, Alto Orinoco, and Cunucunuma. Near the Barra it is frequent, but less so than the Bacaba. The forests opposite San Carlos, extending from the Rio Negro to the Xié, are literally sown with Pataná. The fruit is in season nearly all the year round. We are just now beginning to make use of it, and we shall have it (in unlimited quantity, if there were always Indians to climb the trees) all along until November. I am passionately fond of Pataná-yukissé, and it is the only thing I shall regret when I leave

San Carlos. When I have passed a long time without drinking it, and recommence, I always find it slightly aperient, but this effect passes off in two or three days.

The *Jupatí* (*Raphia tædigera*) is said to have a very oily fruit, and I know that at Pará flambeaux are made of the leaf-stalks by merely stripping off the rind. I have never seen this Palm since leaving Pará.

Among oil-yielding Dicotyledons of equatorial America, I suppose the *Andiroba* (*Carapa Guianensis*) holds the first place. Andiroba-oil has the great advantage (in a tropical climate) of being so bitter, that neither ants nor any other insects will touch it. The tree is abundant near Pará, especially at the mouth of the Tocantins, and is met with all the way up the Amazon.

From the seeds of two trees, apparently undescribed, abundant on the Alto Rio Negro, Orinoco, Casiquiare, Pacimoni, etc., the Indians prepare a paste resembling cream-cheese in appearance and taste. The seeds are first boiled, and then steeped for some days under water, after which they are broken up by the hand. In the boiling a quantity of oil is said to be collected, but I have never been able to get a sight of it. These Indians are exceedingly shy in showing to a white man the edibles, etc., whose use is peculiar to themselves, thinking that his only object must be to ridicule them. I first saw one of these trees (the *Cunuri*, a *Euphorbiacea*, allied to the India-rubber tree, but with simple leaves) near San Gabriel, above two years ago; and though I have since that time continually come upon it, it is only very lately that I met with its flower and fruit on the Casiquiare, and still later that, on the upper Pacimoni, I came upon some Indians eating Cunuri cheese (if I may so call it). From them I obtained a small quantity, which I wish to send you, but have at present nothing to put it in. For Cunuri-oil I must still wait with patience; it is said to be as bitter as Andiroba-oil, but to afford an excellent light. The other tree, whose products are quite similar to those of the Cunuri, is called *Uacu*. It is a Leguminous tree, with pretty pink flowers of very curious structure, and I sent Mr. Bentham two species of it from the Rio Uaupés.

There are numerous other trees and palms of this region yielding oil, and I have only particularized a few of those which are so abundant that their oil might be procured in any quantity, were there only industrious hands to collect it.

Of resins, also, there is no lack, but I doubt if any of them would

come in for candle-making. The Venezuelans make a flambeau, which they call *mechon*, of the resin of various species of *Icica*, poured when melted into the decayed stem of the blowing-cane Palm, from which the soft interior has fallen away, or into a bamboo. It emits rather too much smoke (as Mr. Wilson remarks of resins); but the odour is very agreeable.

To come now to the question of the possibility of collecting these oils;—1, in such quantity as to admit of their properties being tested; and 2, in such larger quantities as would be required for making them articles of commerce.—Few as have been my contributions to your Museum, they have cost me no little trouble and time to obtain them. Everything here must be paid for beforehand. If I require Indians to row my boat, I must prepay them for the voyage; and as they are constantly needing something or other during the voyage, they are sure to owe as much at its close as they did at its commencement. If a trader wishes to get together a cargo of sarsaparilla, or any other product of the country, he must start up one of the rivers with a cargo of goods, which he distributes as he goes along to all the Indians who are disposed to work, marking the time of his returning to the same spot to receive payment, at three months, or six months, or perhaps twelve months. When he comes again, he perhaps spends two or three months in seeking up his cargo—beating up the Indians at their sitios—dragging his boat up cataracts, and threading wearisome forest-tracts; and if, after all this, he succeeds in getting together half the quantity owing to him, he considers his success extraordinary. He must of course go the following year to the same place, and, without a further advance of goods, he will not receive a single stick of what was left owing to him. Thus it has happened, that many persons who have come up the Rio Negro with a cargo of goods, intending to purchase "generos" of the country and return laden with them, have found it necessary to leave their goods and return empty-handed; while in the following year they come again to collect a modicum of their debt, and leave as much more on credit. They have thus no alternative but to go on year by year to the end of their days, and never possess a farthing they can call their own, their original cargo having been furnished on credit, by some merchant in Pará or the Barra. Such is trading with Indians; and I leave you to imagine, besides, the many contingencies which may occur, all against the unfortunate trader. Indians die, like other men, and far oftener

hide themselves in the forest when the day of payment arrives, or shift their quarters permanently.—The same mode must be followed in everything, even in the procuring of eatables. If I need fish, I must first pay the fisherman, and perhaps lend him hook and line, in which case some powerful fish is pretty certain to carry off the hook; though how it should come to be snugly deposited in a corner of the Indian's *matiri* (bag) is not so easy of explanation. About three months ago I bought, on the Casiquiare, a quantity of *cabezones* (a small turtle frequent in some lagoons), intending them for provision during the winter; but they are to this day still swimming in Lake Vasiva, and are likely so to remain, when I am far away from Venezuela. To those who are fixed for life in one place, this state of things may not appear so intolerable; but a traveller like me, who must from time to time remove his abode to a considerable distance, notwithstanding he uses the utmost caution, may expect to leave in every place he visits no small percentage of his income in bad debts.

I omitted to mention above, among oil-bearing trees, the Castanha or Juvia (*Bertholletia excelsa*), which affords a sweet-tasted oil in considerable quantity. The tree is so abundant in some parts of the Amazon, that I suppose its oil would be as easily obtained as that of the Andiroba.

On HENRIQUEZIA VERTICILLATA, Spruce: *a new Genus of* Bignoniaceæ, *from the Rio Negro, in North Brazil; by* GEORGE BENTHAM, ESQ.

This was one of the finest trees met with by Mr. Spruce, in his voyage up the Rio Negro, in December, 1851. It was frequent in the Gapó from above Barraroá to San Gabriel do Cachoeiras, and, as suspected by Mr. Spruce, forms an entirely new and remarkable genus of *Bignoniaceæ*. It is therefore with much pleasure that I can accede to his wish that it should be dedicated in his name to Senhor Henriquez Antonij, a native of Leghorn, but for more than thirty years settled at the Barra do Rio Negro, where he has constantly rendered every assistance to scientific and other travellers during that period.

The evident affinities of this genus are with *Platycarpum* of Humboldt and Bonpland, supposed to be identical with *Sickingia* of Willdenow. The five equal and perfect stamens, and the short broad fruit

with very few seeds, are the same, as well as the general habit and simple leaves. On the other hand, the semi-adherent calyx, with a persistent base and only four lobes, and the shape of the corolla, so much more Bignoniaceous than that of *Platycarpum*, are marked generic distinctions. The adherent ovary in particular, analogous to that of *Gesneriaceæ*, is as yet unique among *Bignoniaceæ*. It is to be regretted that Mr. Spruce did not meet with the fully formed fruit; but in its young state it appears not to be compressed, like that of *Platycarpum*, and to be more fleshy. The base of the calyx enlarges and still adheres closely to it, but the apex of the fruit acquires a still greater development, and the seed-bearing portion becomes almost wholly exserted. The young seeds, two in each cell, showed already an appearance of a winged margin, although possibly that may have been the mere effect of desiccation in the single young fruit I possess.

The following are the technical characters :—

Henriquezia, Spruce.—*Char. Gen. Calyx* basi turbinatus, persistens, subcarnosus, ovarium cingens et ei adnatus, limbo supero campanulato semi-4-fido circumscisse deciduo. *Corolla* oblique infundibularis, fauce ampla elongata, limbo 5-lobo, lobis subæqualibus æstivatione bilabiatis. *Stamina* 5, corolla breviora, subæqualia, antheris oblongis omnibus fertilibus. *Ovarium* subadhærens, disco carnoso breviter cupulato coronatum, placentis 2 in medio loculo contiguis subbiloculare, ovulis in quaque placenta 2 (v. 4 ?). *Fructus* (junior) semi-immersus, depresso-globosus, carnosus, bilocularis.

Species unica : *H. verticillata*, Spruce.—*Arbor* pulcherrima, 50 ad 100 pedes alta, trunco 4 pedes crasso, ramis summis fastigiatis subquinatim verticillatis, ramulis inflorescentiaque ferrugineo-tomentellis mox glabratis. *Folia* simplicia, 4–5-natim verticillata, petiolata, anguste oblonga v. oblongo-obovata, 8–10 poll. longa, 2–2½ poll. lata (inferiora verosimiliter majora), obtusa v. breviter acuteque acuminata, integerrima, basi cuneata, glaberrima, coriacea, supra nitidula, subtus costa media venisque primariis valde elevatis percursa, rete venularum vix conspicuo ; petiolus ½–1-pollicaris, basi dorso sub insertione glandula lævi signatus. *Panicula* terminalis, late thyrsoidea, ferrugineo-tomentella, ramis crassis subcompressis verticillatis et dichotome cymiferis. *Calyx* incurvus, crassus, fere 6 lin. longus, extus ferrugineo-tomentosus, intus sericeus, limbus ad medium divisus in lacinias 4 lato-lanceolatas acutas æstivatione vix imbricatas, quarum

infima parum latior. *Corolla* sesquipollicaris, extus tomentoso-sericea, in vivo rosea, intus alba, glabra, præter lacinias puberulas et pilos flavicantes ad basin faucis et secus lineam mediam labii superioris. *Stamina* glabra, antheris longis medifixis longitudinaliter bilocularibus. *Stylus* basi glaber, apice in lamellas stigmatosas v. oblongas hirtas divisus. *Discus* epigynus, brevis, pubescens. *Fructus* junior usque ad medium calycis basi cinctus, superne liber, pulvinatus. *Semina* in quoque loculo perpauca (duo tantum?), orbiculata et ut videtur marginata.

Report of a Journey of Discovery *into the Interior of* Western Australia, *between 8th September*, 1848, *and 3rd February*, 1849; *by* J. S. Roe, Esq., Surveyor-General.

(*Continued from p.* 247.)

Feeling disappointed that the surface coal (if any exists on this shore) should hitherto have eluded our observation, after the plain indications we had witnessed, I proceeded N.E. to search for any probable outcrop along the beach, and observed the sand-dunes of the coast to be supported and partly formed by calcareous sandstone, in horizontal layers or low cliffs, among which were many fragments of slaty shaly rocks. To seaward of these, appearances were in favour of fresh water being procurable in many places among the sand-hills, at a very short distance below the surface, and at the end of a mile and a half a remarkable spring of excellent water was found trickling from the bare dunes at a considerable elevation above the beach. We found most tempting little pools of clear water in the pure sand amongst the limestone rocks, and our native said that good water was always procurable here by scratching a small hole in the sand.

The surface now became strewed with many fragments of thin slaty rock, and at the end of a quarter of a mile I stood upon the summit of what had appeared from a distance to be a large bare sand-hill, but which in reality proved to be a mass of coal-shale, blended with a whitish schistose rock, disposed in thin parallel plates. The whole were highly glazed over, by the influence probably of the sea air, and bristled up so sharply at an angle of 5° or 10° from the vertical, that the hill was perfectly impassable for horses. The dip of the shales was

here found, with some surprise, to be S.W. by S., and combined, with the great alteration also observed in the angle of its dip, to show that a very great geological change had taken place in the features of the country within the space of two short miles. I had visited the hill because it lay in the direction towards which the shales were tending from the southern shore of the estuary just left. A continuation of those shales I certainly met with, as expected, but showing so different an arrangement as to direction and dip, that I could only account on the spot for the sudden change by supposing that the Middle Mount Barren ranges had been thrust up from below at a period subsequent to that which formed the country around them. The flat-topped summit of the Mount was distant only one mile to the N.E. $\frac{3}{4}$ E.; but in the bottom of that short space lay another inlet from the sea, with a dry sand-bar at its mouth, and two streams flowing into the head of it, which was less than two miles distant to the W.N.W. As the sun was near the horizon by the time I had completed a round of angles from this bare hill, and we had yet much to do before reaching our camp, I moved on westward, and in two miles and a half came to a part of the larger inlet just below its very projecting cliffy headland. Having from the opposite shore considered this spot worthy of inspection, the horses were left in charge of Bob, while we scrambled down the steep rocky bank to some low cliffs, and fully examined them and the adjoining shore up and down, but to no good purpose. The cliffs were of light-coloured, hard sandstone and conglomerates, in massy horizontal layers, and the land in front was low, very swampy, and thickly covered with Tea-trees. Although this spot was in the line the shales were taking from the opposite shore of the estuary, not the least appearance of any were here visible, nor anything further to indicate the near proximity of coal. As the day had now closed in, we recovered our horses, and soon after dark reached the camp, though scarcely satisfied with the unproductive result of our harassing day's work. That coal exists in the vicinity of the lower part of this estuary, although probably not at the surface, there seemed no reason to doubt; all its attendant clays, shales and sandstones, ironstone-veins, conglomerates, etc., having been there seen in abundance; but the great derangement which is observable in all the geological strata near the sea, about Middle Mount Barren, is calculated to throw out any but a practised geologist, and to lead to a belief that, if coal is discovered there at all

by any other person, it will be by mere accident. It was gratifying to find that the estuary itself, and the lower reaches of the river, afforded good and open navigation for boats, in a space of five or six miles to the bar, which was distant only twenty-four miles from sheltered anchorage, in the southern part of Doubtful Island Bay, where, on the formation of a depôt, steamers might be convenient to the shore, and coal in security. Notwithstanding also the roughness of the seven or eight miles which intervened between the coal actually discovered, and the head of navigation on its river, there is reason to believe a very good and tolerably level road may, without much difficulty, be carried between them, and probably between the coal-bed and its nearest bay of the sea-coast to the S.E., distant about the same number of miles; but of the latter I have no means of speaking with any degree of certainty.

With these facilities, aided by the projection of a strong pile jetty into the bay at the estuary's mouth, the inexhaustible bed of coal we discovered on the 27th of December may at this particular juncture be considered a most valuable acquisition to the colonial resources, and, if worked and rendered available for the use of steamers, will have presented itself very opportunely on one of the intended lines of steam route.

These important considerations connected with the river on which we were encamped, joined with the large quantity of good country we had seen on its upper branches, induced me to name both the river and inlet after His Excellency Governor Fitzgerald; the small river on which we had halted on the 26th, and which forms a pretty little tributary to the Fitzgerald, being called the "Elèves." Aldebaran on the meridian gave the latitude of our camp 34° 3′ 26″ S.

Being now in possession of the material facts that a broad seam of coal, if not several parallel seams, traversed this part of the country in an E.N.E. and W.S.W. direction, and that we had been very near to, if not actually upon, one of them, amongst the red sandstone lakes noticed on the 12th of November, 160 miles to the E.N.E., I became very desirous of tracing these seams further in the opposite direction, where they might possibly be detected cropping out on some of the various stream-beds and inlets which fell into the south coast. I accordingly broke up the camp on the morning of the 30th, and proceeded from this interesting locality towards West Mount Barren, regretting

that time did not admit of my making some further examination of Fitzgerald Inlet, amongst the precipitous rocky glens of which it seemed very probable that coal might even yet be found near the surface on further examination, with the assistance of a boat.

Proceeding south from our camp of 28th and 29th of December, the Fitzgerald was crossed at our former ford at the end of three-quarters of a mile, and we then entered on an extensive level flat of excellent kangaroo-grass, which had afforded our horses both rich and abundant food. Beyond this we emerged from the valley of the river by ascending one of its tributaries coming from the westward, where the country was exceedingly rough, steep, and rocky, covered with coarse stunted scrub, and difficult of access. Further to the south it appeared even worse.

At the end of five miles we crossed over a poor sandy ridge at the source of this branch, and then crossed two others belonging to a different stream, which seemed to have its exit to the sea by a break in the coast-hills three or four miles to the southward; the country around extremely rocky, rugged, and scrubby. In the westernmost of these branches we crossed a briny salt stream, in pools, at foot of some well-defined yellow and brown sandstone cliffs, commencing eighty or ninety feet below the general surface of the country above. Salt was encrusted upon them, and had oozed out between the layers.

In three miles more, over open gravelly sand-plains, covered with low heathy vegetation, we were passing a mile to the N.W. of the remarkable double-topped summit of Mount Bland, and both here and at the adjoining hill, West Mount Barren, observed a remarkable change in the character of the vegetation. Many plants and shrubs long lost sight of, here re-appeared under the protection of the hills. Mr. Drummond's new *Hakea Victoria* especially seemed to be perfectly at home, in all its splendid magnificence; and we felt another stage had been accomplished in our journey by the re-appearance of the "Mungart," or Honey-bearing *Banksia*, so prized by the natives during its flowering season.

West Mount Barren being passed on its north side, we were descending from a shoulder about half a mile westward of its western base, when shales were again met with, lying as before, W. 25° S., and *vice versâ*, and dipping south-eastward at an angle of 5° or 10° from the vertical. They were extensive, and seemed to traverse the Mount

also through its whole extent; the neighbourhood being likewise strewed with quartz, ironstone, and all the conglomerates and rubbish heretofore observed to be associated with the shales.

The land continuing to dip as we proceeded south-westward along a small watercourse, with the shales occasionally visible at the surface, we came at the end of three miles to a very abrupt descent, almost amounting to a cliff, of red sandstone, overlooking a river at its base winding to the south-eastward. Much good grass was in and about its bed, the main branch of which seemed to come from the south-west and westward, and to be joined immediately beneath us by a grassy tributary from the N.W. Descending carefully and without accident, I encamped amongst Yeit and Mainung Wattle, at the fork formed by the tributary, and found the water in one of the large deep pools perfectly fit for use, though slightly brackish or sweet. Grass was in the greatest abundance, and of the best descriptions, fit at this time for making many tons of excellent hay, the kangaroo-grass in particular being in its prime, with heavy seed-tops, and young green shoots below.

This day's rough travelling again forced upon me the necessity for sparing the horses as much as possible in such a country, and indeed ourselves also; for not only were the shoes of the former lamentably on the decline, and their feet very sore, but some of the bipeds of our party were likewise nearly unshod, and neither nails, leather, nor tacks remained to effect any more repairs. It was therefore with some concern I learnt from our native that this river came through a very rough and rugged country; though the disagreeable information was somewhat qualified by the assurance that the good grassy land upon it extended only a short distance further upwards, and was then replaced by thick scrub. This changed my first intention of tracing it up, and induced me to proceed next day in the opposite direction, for the purpose chiefly of examining the river's estuary, the mouth of which I remembered to have passed some years ago, on the western shore of Doubtful Island Bay.

Observing the latitude of our camp to be 34° 14′ 5″ S., and West Mount Barren to bear N. 21° E., three miles distant, we proceeded E.S.E. down the river in the morning, Messrs. Gregory and Ridley tracing the bed as far as the termination of the cliffs, half a mile lower down, with the chances of falling in with an outcrop of coal; none

however appeared, and a mile further the estuary was seen, its mouth being about four miles distant to the eastward. The natives call the country around this sheet of water Yoor-de-lup, and the land about the Fitzgerald Inlet, Gnang-meip. Our river now assumed a more bold and decided character, sweeping in fine open reaches forty to sixty yards wide in the space of a mile, when it joined the estuary near a red cliff of considerable elevation on the left bank. The country around had nothing to recommend it; but the estuary appeared, through the trees which buried its southern shore, to be open and navigable for boats. Several long points projected into it along its entire length of three miles, forming on either side deep bays or coves, in which were observed many ducks, teal, and black swans. From a dry sand-bar at the mouth of this estuary, Point Hood, which forms Doubtful Island Bay, bore S.E. by S. four or five leagues distant, and the shore abreast was observed to be free of rocks, but without any headland or bay to afford shelter for boats or small craft. The anchorage in the southern part of Doubtful Island Bay, being however only nine or ten miles distant, would always afford a ready and valuable resort for vessels, should this estuary ever be brought into requisition for the transport of coal by water. Outside the bar the beach is very broad and level, and good fresh water is procurable by scratching to the depth of nine inches in the little sandy hollows behind high-water margin.

Naming this inlet the Gordon, and its river the Gairdner, we quitted both, and proceeded five miles along the beach to the south, where the travelling was good, and enabled us to avoid much rocky and rugged country.

After crossing the dry sandy mouths of several small watercourses in pools, some fresh and others salt, which discharge themselves upon the western side of this Bay, we quitted its sandy shore at the commencement of the granite formation, and proceeded for six miles south-westward, over very uneven grassy laud, bare of timber, except clumps of Tea-trees and Peppermint in numerous small hollows, and abounding in kangaroo. This space would afford cattle or horses a good run, but is in some parts too much covered with low scrub to answer for sheep. Coming out then on the shore of Bremer Bay, we made use of its soft sandy beach for three miles more, a heavy sea rolling in with a strong southerly wind, and breaking high at the distance of 150 yards from the steep sandy beach. At 50 to 100 yards behind the shore, high

sand-dunes, scantily clothed with brushes, were partially supported by a long line of white cliffs of calcareous sandstone, which also abutted on the granite-formed land at the northern end of the Bay, but had there changed in colour to red and yellow.

At the more sheltered southern corner of this long beach is the sandy-barred mouth of another inlet from the sea, which I had on a former occasion ascended in a whale-boat, to the distance of ten or twelve miles, and was now desirous of further examining by land. Crossing its dry bar therefore, and considering in passing that the waters of the estuary were at least five feet above the level of the sea outside, we encamped after dark at a good spring-well of excellent water, a mile further up, in the midst of a small patch of rich luxuriant feed for our tired horses. The soil is good, and much mixed with marine shells. Red cliffs were visible on the northern shore between one and two miles higher up, but the indications for coal since leaving the previous camp had been but few and remote, granite appearing to form the basis of the country along this portion of the coast, and the red sandstones to retire further inland.

Here were exchanged our limited congratulations on the succession of a new year. The 31st had been very cloudy and threatening, with light showers from the S.W. These increased after we had encamped, and the old year, 1848, went out with us exceedingly wet and boisterous.

(*To be continued.*)

BOTANICAL INFORMATION.

James Edward Winterbottom, Esq.

We have been favoured with the following particulars from a near relative of the late Mr. J. E. Winterbottom, whose death was mentioned in our last month's number.

"He was born on the 7th of April, 1803, and was educated at private schools, partly at Twyford, near Winchester, under Mr. Clarke and Mr. Bedford, successively; but principally at the Rev. Dr. Meyrick's, at Ramsbury, in Wiltshire. He was entered, as a Commoner, at St. John's

College, Oxford, in May, 1821, and went into residence in Easter Term, 1822. I do not find when he took his B.A. degree, but imagine it was in 1826, and his M.A. degree I suppose about 1828. His B.M. degree he took in July 1833, when he received a license to practise.

"I find that, in the Academical year 1824–25, he attended the following courses of lectures, in addition to the classical and mathematical studies required for his degrees, viz.:—

"Dr. Daubeny's Chemical course; Dr. Kidd's first and second Anatomical courses; Dr. Buckland's Geological course; M. Rigaud's (probably on Experimental Philosophy, but I do not find the subject mentioned); Dr. Williams's Botanical course. He attended very diligently the practice of St. Bartholomew's Hospital for two years, from February, 1827. He at the same time followed the courses of lectures given at that hospital; and pursued the study of anatomy by dissection. He acted also as dresser to, I think, the late Mr. Earle, for twelve months, at that hospital. Amongst the Lecturers were Dr. Hue on Chemistry, Mr. Abernethy on Surgery, Mr. Lawrence on Comparative Anatomy, etc. He never, however, practised the profession, as he found the anxieties attending it were too oppressive for him; and he happily turned the knowledge he had so painfully acquired to account in the pursuit of the studies in art and science, which he afterwards so zealously cultivated.

"In November, 1830, he became a member of the Geological Society, and in February, 1831, of the Geographical. The date of his admission to the Linnean I do not find, but I think it must have been anterior to the others. He availed himself much of the Library of the British Museum, and being elected to the Athenæum Club in 1833, had the advantage of their excellent library.

"As a boy and a youth he had a great passion for a military life, but yielded to his parents' remonstrances, to take a University education; and he chose the medical profession, as embracing subjects most congenial to his tastes and pursuits. His range of study embraced architecture, sculpture, painting, and engraving.

"He made almost annually some tour in furtherance of his pursuits. In 1834–5 he travelled through north Italy, and to Rome and Naples, returning by Switzerland and the Rhine.

"In the autumn of 1836 he visited Devonshire and Cornwall; in the autumn of 1837, the west and south of Ireland (taking the lines by

Dublin to Galway, Limerick, Killarney, Cork, Waterford, and home by Milford Haven); in the autumn of 1838, the east of Scotland (going by sea to Edinburgh, thence by Montrose to Aberdeen and Braemar, and by Dundee and Perth back to Edinburgh, and thence to Newcastle by sea); and in the same season he made the tour of the Westmoreland and Cumberland Lakes, visited the salt mines of Cheshire, and went through Derbyshire and Warwickshire. The winter of 1839 he spent at Torquay, in Devonshire, in consequence of the illness of his mother and youngest sister. In 1840 he made no excursion, in consequence of his mother's death in September. In 1841 he made a tour of the Isle of Wight (he had previously passed a winter, 1833–4, in the south of the island), and afterwards in North Devon. In July, 1842, he spent ten days in excursions about High Force, near Barnard Castle, in Durham; and in October, took a run into Monmouthshire and Herefordshire. In 1843 he went again to Ireland, going by Cork (where he spent a fortnight at the meeting of the British Association, in August), and from thence making a three weeks' tour with Dr. Babington, and then spending ten days at Killarney, and afterwards passsing by Galway to Sligo, Derry, the Giant's Causeway to Belfast, and thence to Dublin, where he remained two months and a half studying, returning to London the middle of January, 1844. In the autumn of 1844 he again visited the Lake district of Cumberland, spending upwards of a month there; and then went on by Newcastle and Berwick, and Dryburgh, Melrose and Abbotsford, to Edinburgh, whence (on December 3rd) he went to Glasgow for three or four days, and returned on the 7th of December. He remained at Edinburgh for the purposes of study to the 8th of April, 1845, and then returned to London, taking Chatsworth again on his way. In June and July, 1845, he took a short turn in Norfolk and round by Chatsworth again.

"On the 4th of January, 1846, he left England, *viâ* Southampton, on his Indian tour. On arriving at Bombay, he found he should be too late for crossing the plains to the Himalaya that season, and accordingly determined to go at once to Java, and up the coast of China. He arrived at Batavia about the 20th of June, and after making excursions about the island, returned there on the 24th of July; and on the 27th went by a steamer to Singapore, which he reached on the 1st of August. I have no dates or particulars here of his proceedings after this time, and can only speak from my recollections. He was to leave Singapore by

the China mail on the 4th of August, 1846; he went of course to Hongkong, and then up the coast as far as Shanghae, and returned by the same route to Singapore; to Calcutta, and on by Benares, Agra, and Delhi to Lahore. He next journeyed through Cashmere (and was treated as a prince by Goolab Sing), and afterwards through Burdakshar, beyond Gilgit, to about the 35° of N. lat. He made a short turn into Little Tibet, and returned through Cashmere to Lahore. He then went to Nepal, and afterwards made the excursion over the Himalaya into Tibet to the lakes, which are the sources of the Indus and Sutlej, with Captain Strachey, and of which you say he is writing the particulars. He returned through Agra to Bombay, and home again by Egypt, Malta, and Gibraltar. He seems to have left Bombay about the 3rd of April, 1849, and arrived at Suez on the 19th. He remained in Egypt, visiting the Pyramids, etc., till the 12th of May, passed Gibraltar on the 23rd, and Cape St. Vincent on the 24th of May, 1849. On his return from India in 1849, he formed here an Arboretum, principally for the *Coniferæ*, to which he seemed most partial. He had, however, for years previously, been bringing plants together, and planting them in the garden, so far as the space would permit; and he had a good number of plants potted before he went out, which were ready for planting on his return.

"I have no materials here to give you information as to his proceedings in 1850–1. In 1852 he was again in Ireland; I do not remember what parts he visited, but he had settled down in Dublin for some time, when, at the end of October, 1852, he was summoned home by the sudden death (that is, after a few days' illness) of his last surviving sister. In the summer and autumn of 1853, he was, I believe, principally at home. On the 3rd of January, 1854, he started again, *viâ* Southampton, for Egypt, and arrived at Alexandria on the 20th, and went on the same afternoon to Cairo; where, having secured a good Dragoman at Malta, he soon provided himself with a boat (50 feet long, by 10 feet beam), and a crew of eight men and a boy, and all requisites for the voyage, and on the 24th started alone (not to be encumbered with an untried companion) up the Nile, determining not to stop for anything on going up, but take every advantage of the wind, and visit everything on his descent with the stream. He passed the first cataract on the 13th of February, and entering Nubia, went on to Aboo Zimbel (about forty miles below the second cataract), where, from the slow

progress made, for want of wind, and the great heat (96° in his cabin, 121° in the sun, and 131° where the boat was covered with black silk), he determined to terminate his voyage up. Having arrived there on the 20th of July, on the following day he commenced his return. The distance through Nubia, from the first cataract to Aboo Zimbel, was about 180 miles; on his way down, he of course visited Philœ, the granite quarries, Thebes, and everything of interest. He reached Cairo on the 2nd of April, and spent a week there. On the 14th of April he left Alexandria in an Austrian steamer for Beyrout, in Syria; thence on the 25th of April he started, with tents and mules, over the Lebanon range to Balbec; thence through the mountains of the Anti-Lebanon to Damascus; thence by the site of Dan to the Sea of Galilee, Jericho, and Jerusalem, whence he visited the Dead Sea, and of course all the places of sacred interest. Having stopped there ten days, he went on to Beersheba, and to Gaza, and returned thence by the coast to Beyrout; and having visited Tyre and Sidon, went up to "the cedars," and almost to the summit of Lebanon, about 4000 feet above them. Returning to Beyrout, he started in an Austrian steamer, the "Adria," for Smyrna, on his way to Constantinople; but, being taken ill of diarrhœa, he was put on shore at Rhodes on the 3rd of July, and died on the following day, after (it is said) six days' illness.

"I imagine that he must have made acquaintance with you on some previous journey to Scotland, probably in 1828 or 1829 (when he went, I think, to the Isle of Skye); but I have nothing to show when it was. You will observe that in 1838 his tour was confined to the eastern side of Scotland. His only other visit to Glasgow would seem to have been in December, 1844."

CYPERUS POLYSTACHYUS, *Röttb.*

The Botanic Garden has lately received, through the kindness of Edward Ayshford Sanford, Esq., of Nynehead Court, Somerset, a plant of the *Cyperus polystachyus*, from the mouth of the crater of the extinct volcano of the island of Ischia, which, if not possessed of much beauty to recommend it, is interesting from the above-mentioned spot being the only locality in Europe, and in its there flourishing where the

steam is continually issuing at a temperature of at least 150° Fahrenheit. The plant is, essentially, a warm-country species, tropical and extratropical, in Asia, Africa, and America: and thus in Europe the only place of growth is that where the heat is, as it were, especially suited to it. The question naturally arises, how did the plant find its way to this single spot? for it "grows only," Mr. Sanford observed, "on a space about thirty feet in diameter, in this heated atmosphere." Professor Tenore offers the following theory, in his observations on the subject.

"It grows exclusively in the island of Ischia, and close to the little steam-holes (*fumarole*) of Frasso and of Cacciotti. It is accompanied by *Pteris longifolia;* it is perennial, and flowers in June. Both these plants strike their roots deep into the soft soil of the *fumarole*, where the temperature is of 50 to 60 degrees (of Réaumur); and they cannot be plucked up without scorching one's hands. The atmosphere has a heat of 30 degrees. When removed to the Royal Botanic Garden of Florence, and left in the open ground, these plants were unable to bear the cold of winter, and it was found necessary to shelter them in the stoves."

How can this *Cyperus*, a native of the Cape of Good Hope and the East Indies, and its companion, *Pteris longifolia*, hitherto only found in Jamaica and Hispaniola;—how, I say, can we account for their growing in this single spot, of all Europe, and exclusively in a locality where circumstances create a climate wholly different from that of the surrounding countries, and which resembles the atmosphere of the blazing Tropics? For the solving of this question, many conjectures may possibly be offered; and among them I have lighted upon one, over-bold perhaps, and certainly very strange, but which I shall still venture to propound here; it is, that the successive reproductions of this plant have resisted the force of ages, and enabled it to perpetuate itself through all those atmospherical catastrophes which have altered the climate of Europe, because its seeds have been developed in that high temperature, which the half-extinguished volcanoes still preserve in the bowels of the island of Ischia."

The fact of its growing in this locality is so well known to the Italians, that the plant is called "*Cipero d'Ischia,*" and "*Giunco delle fumarole.*"

NOTICES OF BOOKS.

JAUBERT ET SPACH: ILLUSTRATIONES PLANTARUM ORIENTALIUM; *ou, Choix de Plantes Nouvelles ou peu connues de l'Asie Occidentale.* Imp. 4to. Paris.

The plants of Western Asia ought to have more than usual interest to us, now that our armies and so many other British subjects are congregating in the Crimea, and that we have so much intercourse with the Turkish Empire. It were devoutly to be wished, that, as Buonaparte did in Egypt, we should have men of science attached to our armies in countries whose productions are little known to us; and thus we should be sure to have some favourable results. The present work is eminently rich in the rare and novel plants of these Oriental regions, and most beautifully and carefully are they represented in it. Four volumes complete, and three fasciculi of the fifth volume, are now before us, and well does the work maintain its character. We noticed, in our Journal for 1853, as far as the third number of the fourth volume. The following is devoted entirely to Grasses: the fifth, or thirty-fifth of the whole work, takes up *Compositæ* (chiefly occupied by new species of *Pulicaria*), as in the thirty-sixth; while the thirty-seventh, to the conclusion of the (fourth) volume, contain a fine set of various families of *Corollifloræ*, and mostly new species. In the thirty-ninth fasciculus, and in all the following, as far as Tab. 429, we find all the figures taken from the celebrated collection of "Vellums (Velins) of the Museum" of the Jardin des Plantes at Paris, which, as is well known, were commenced under the auspices and direction of Gaston d'Orléans, brother of Louis XIII., and, is continued, we believe, to the present day, at the expense of the French Government. The finest portion of these were executed by a distinguished artist, who accompanied Tournefort in his voyage to the Levant; and, as the finest collection of drawings of Oriental plants in England are from the pencil of Ferdinand Bauer, so are those in France executed by M. Aubriet. A portion of them have been published by Professor Desfontaines in the 'Annales du Muséum d'Histoire Naturelle,' —about sixty, we believe. These original drawings, beautifully coloured from nature, are confined to the 'Corollarium Institutionum Rei

herbariæ' of Tournefort, "in quo plantæ 1356 in orientalibus regionibus observatæ recensentur et ad genera sua revocantur." Beautifully as, no doubt, they are executed, they are sadly deficient in analyses and dissections, as may be expected in drawings made more than a century and a half ago, and in this respect form a striking contrast with the other figures of Messrs. Jaubert and Spach's work, in which the analyses are so well and carefully executed.

WILLKOMM, MORITZ: *Icones et Descriptiones Plantarum novarum criticarum et rariorum Europæ Austro-Occidentalis, præcipue Hispaniæ.* Imp. 4to. Lipsiæ. Fasc. 3–5.

In our notice of the first Fasciculus of this work (see our last vol., p. 94), we expressed a hope that the future numbers might present a greater variety, and plants of more general interest than that contained. But we are disappointed. Here are well-executed plates, and the most laboured and lengthy specific characters and synonyms and localities. Here are five fasciculi, at a cost of ten dollars, occupied by the Genera (almost wholly Spanish) *Dianthus*, *Gypsophila*, and the *commencement* of *Silene!* From the terms "Plantarum novarum et rariorum," we were led to suppose that there would be much of novelty, as well as rarity; but, instead of these, the author's object seems to be to multiply well-known species, beyond what we have witnessed in any author, even in this age of species-making. Yet one has only to look at the labours of a Boissier in Spain, to be satisfied how much there is that needs illustration of a highly novel and interesting character.

BULLETIN DE LA SOCIÉTÉ BOTANIQUE DE FRANCE; *fondée le* 23 Avril, 1854. Paris.

This promises to be a very useful Journal, and, with the highly respectable names of the President (Ad. Brongniart), Vice-Presidents, etc., of the Society which conducts it, we cannot doubt of its meeting with the success it deserves. Besides original papers and notices of the discussions at the Meetings, each number contains a "Revue bibliographique," and several pages devoted to "Mélanges et Nouvelles."

Letter from JOHN MACGILLIVRAY, ESQ., Naturalist of H. M. Surveying-ship Herald, *commanded by* Captain Denham; *dated* Sydney, March 3rd, 1854.

[We have already (vol. v. p. 279) reported progress of this voyage, destined to make a scientific survey of certain islands in the South Pacific, in a letter from Mr. Macgillivray, dated Sydney, February 23, 1853. We have now the great satisfaction of publishing extracts from a highly interesting letter from the same gentleman, detailing the particulars of the first cruise among the islands.]

We sailed from Sydney on September 2, 1853; the Torch had been left behind, and most of her officers and men transferred to the Herald. Three days afterwards we anchored at Lord Howe Island, where we remained ten days. This little island, which is distant from the nearest part of Australia about 300 miles, is only six miles in length and a mile and a half in greatest width. At one end are two mountains, respectively 2498 and 2834 feet in height. The greater part of the island is thickly wooded. There are three families and two or three other persons living on the island, but they will shortly be obliged to quit, as it is intended to form there a penal settlement for the convicts of New South Wales and Victoria. I had a tent on shore during the whole of our stay. Our surgeon (Mr. Reyner, who is and has long been a zealous collector for Haslar Museum) volunteered to join my party, and of course Milne was one of us. His collection of the plants of the island is probably tolerably complete; mine of course is very imperfect, as zoology necessarily took up most of my time. There are only (excluding a few Mosses and Lichens) thirty-six species in my fasciculus, out of which twelve are Ferns. I should think the vegetation assimilates to that of Norfolk Island; there is however no representative of the *Coniferæ*, and several of the plants appeared to me to be Australian, as *Tecoma Australis*, *Platycerium alcicorne*, etc. But I should feel more at home were I telling you of my three new species of *Diplommatina* (a remarkable genus of land-shells), and a new *Eurycanthus*, the "land-lobster" of the settlers, for on looking over my journal I see very few *botanical* notices.

A dense forest of Palms occupies nearly the whole space between the two sides of the island at this part. Whether this is an *Areca* or a *Seaforthia*, I cannot at present determine, for want of *any* book contain-

ing the generic characters, but it strongly reminds me of what several years ago I made out by Brown's 'Prodromus,' etc., to be *Seaforthia elegans*. Here and there is an occasional enormous Banyan-tree, with its singular root-like supporting stems, and some plants of a *Pandanus* (*Freycinetia*, I think, but here again the want of botanical works steps in), or "tent-tree," as it is here called. My old friend, *Flagellaria Indica*, as usual, is not tied down to the quiet orderly growth of its fellows in the vegetable kingdom, but aspires to paying rambling visits to the summits of the neighbouring trees. What with this, and the Palms, and the Banyans, and the Screw-pines, and the clumps of parasitical *Orchideæ* and Ferns, the forest scenery struck me as having quite a tropical aspect; and when, after passing some cleared land in a neglected state, overrun with weeds (among which were the ubiquitous *Stellaria media* and *Sonchus oleraceus*), and some patches of rude cultivation, we came in sight of the establishment of one of the settlers, the palm-slab built and palm-leaf thatched cottage and outhouses reminded me of a Malayan or Javanese hamlet. . . . Several species of Ferns occurred here. Besides a *Cyathea*, with a caudex ten or twelve feet in length and six inches in diameter, a very handsome *Hypolepis*, a *Pteris*, a *Litobrochia*, and a widely-spreading *Asplenium*, with fronds six feet in length, were plentiful. A long straggling *Polypodium*, and a *Pleopeltis*, ran over rocks and up the trunks of trees. We saw enormous clumps of a *Platycerium*, high up on the Banyans, and got fine specimens from a tree which had been blown down. Along with the Ferns were some fine Lichens, and a beautiful Moss (*Weissia*), which had not occurred previously.

My little encampment was broken up sooner than I anticipated, and we had to rejoin the ship, to our intense mortification, at a period when the carrying out of my plans for the remainder of the time originally allotted would have ensured a thorough investigation of the productions of this interesting island. A quantity of seeds of "vegetables" were distributed among the few settlers; and on our subsequent visit (three months afterwards), I was pleased to find, on the site where the tent had been pitched, a crop of very fine turnips, the produce doubtless of some seed which Milne had accidentally scattered there.

On September 24 we anchored at the Isle of Pines, where we remained a month. This island is situated off the S.E. end of New Caledonia, and is peopled by a similar race of men—the frizzled-hair

Papuans. I shall not however trouble you with any account of my personal adventures, or the customs, etc., of the people, or the zoology, but pass at once to some botanical scraps in my journal.

Being anxious to see the Sandal-wood tree growing, I was taken by an intelligent boy to the thickets on the low grounds behind the beach, where several were pointed out to me. Unfortunately all were of small size, and none had either flowers or fruit. The first which I saw was a small spreading bush, with smooth grey bark, having dark longitudinal broad streaks and dots, and small, glossy, elliptical, revolute, and slightly carinate leaves. At a subsequent period I was more fortunate in getting flowering specimens of the plant. . . . In the stores I was shown a large quantity of Sandal-wood recently procured from an island which, until very lately, was not known to produce it. The locality was confidentially communicated to me, and Mr. Underwood kindly promised to procure flowering specimens of it for me, as I think it may prove a new species. The Isle of Pines and the Aneiteum Sandal-wood trees are specifically distinct, and differ from *S. Freycinetianum* of the Sandwich Islands. . . . Near Hill's I showed Milne some small plants of the Sandal-wood tree, which he attempted, but in vain, to dig up; for they were merely suckers, the parent tree having long ago been cut down to the very roots. . . . Having found a fine Sandal-wood tree in a thick scrub, where it had fortunately escaped the observation of the natives, I procured for Milne a very good section of it, for the usual consideration of pipes and tobacco. This tree was about 25 feet in height, with a diameter below of 6 inches, of which the inner yellow scented portion, alone of any value, occupied 2½ inches. In preparing Sandal-wood for the market, the bark and outer white wood are cut away with an axe, reducing the billets to a small diameter; and those taken from about the root—considered the most valuable, because most highly scented—are very irregular in form. Thousands of tons of this valuable wood have from time to time been furnished by this little island, and the supply has now almost completely ceased.

In this bushy tract of country, the number of beautiful running and climbing plants was considerable. Among the most remarkable is a scarlet-blossomed *Disemma* (*D. coccinea*), and three or four *Ipomœæ*,—one with very large and handsome blue flowers, and another with equally large white ones. Close to a small village I saw some cleared, unfenced ground, where the Taro, Yam, Pumpkin, Gourd, and Sugar-

cane were cultivated. . . . The French "Missionary" establishment is pleasantly situated in an open valley at the edge of the table-land, with a stream from the upper grounds running past, and supplying a swamp lower down, where I found several marsh-plants. On the banks of the stream further up I observed several fine Ferns, especially a *Lomaria* (like *L. robusta* of Tristan da Cunha), with an arborescent caudex three or four feet high, and as thick as one's leg, and having a fine head of long fronds, arching outwards, giving the plant much the appearance of a dwarf Palm. A *Lygodium* spread its green drapery over the trees and bushes on the outskirts of the wood; a fine *Lindsæa* and an *Adiantum* grew by the stream, along which, here and there, were great clumps of a gigantic grass, with leaves a foot in width. . . . The total number of flowering plants collected by me at the Isle of Pines is 137; and from the circumstance of my last two excursions not having furnished a single additional species, it may be inferred that the small collection in question affords a fair sample of the vegetation of the island. Among Cryptogamia, *Algæ* are very remarkably deficient; of Fungi and Lichens I did not observe more than a dozen species; and of Mosses only five kinds. The *Lycopodiaceæ* are only two in number, but the Ferns are well represented by twenty-four species belonging to sixteen genera. Several of the most striking of these have already been alluded to in this journal. By far the most remarkable are two species of a genus (*Schizæa*, Ed.) which I cannot find described. The frond of one is linear and rush-like, of the other dichotomous and flabelliform. The latter bears on the apex of each division of the frond about six minute recurved spikes (collectively assuming a stellate appearance), each with two rows of exannulate capsular spore-cases, corrugated at the apex, dehiscing vertically, and containing two or more discoid sporangia. These two last Ferns, on my subsequent return to Sydney, were referred to the genus *Actinostachys**. The *Gramineæ*, of which there are several striking forms, constitute 16 per cent. of the Phænogamous vegetation; and the *Cyperaceæ*, *Compositæ*, and *Leguminosæ*, respectively 6, 7, and 5 per cent. The great bulk of the vegetation is arboreal; and in the groves and woods there is little underwood, but often *Flagellaria Indica*† and other rope-like climbers. Herbaceous plants occur

* One of them is the *Actinostachys digitata*, Wall. (*Schizæa*, Sw. et alior.).

† There is a very remarkable new genus: with foliage and general habit of some of the very broad-leaved Grasses, but with the flowers, and apparently fruit, of *Flagellaria*;—*n.* 770 of Mr. Macgillivray's collection, *n.* 172 of Mr. Milne's: not a climber.

chiefly on the margin of the woods, and in open places. Of the last description of country great tracts (considering the size of the island, which is only about eight miles in diameter) are covered with Fern (*Pteris* and *Mertensia*), coarse Grass and *Cyperaceæ*. Among the trees which give a character to the landscape, *Eutassa Cookii** takes the first place. This noble Pine, worthy of the illustrious name it bears, is naturally gregarious, but the largest individuals grow singly, or in small clumps. I had no means of judging accurately of the height which it sometimes attains, but estimate it as occasionally being as much as 150 feet, with a girth of 10 to 12 feet near the ground. In appearance this tree differs so much from *E. excelsa*, that I am surprised how the two could have been considered as identical by the botanists of Cook's voyage. Young trees growing in exposed places sometimes assume, for awhile, the pyramidal form of the Norfolk Island Pine, but the larger ones have all the branches short, and the whole tree tapers very gradually to the summit, where it is often capped by a mushroom-like terminal tuft of foliage. In one solitary instance I saw the summit of a very tall tree bifurcated. There is a very striking difference between the foliage of the young plant of *E. Cookii* and that of the tree. In the young stage, which resembles the similar condition of *E. excelsa*, the branchlets are sent out on the same horizontal plane, and the finely linear leaves, which do not touch each other, although verticillate, appear to be distichous. In the adult the leaves are broadly ovate, outwardly convex, and closely imbricated, the branchlets attaining a length of about 8 inches, and a diameter of between 0·2 and 0·4 inches. The largest male catkins which I have seen are 1½ inch long, and lanceolate; the smallest female cones are 2 inches long, and elliptical, while the largest in my possession is 3½ inches long, and almost globular, with mucronate and revolute tips to the scales. The younger female cones remind me of the heads of *Dipsacus fullonum*. From incisions in the bark or cones a thick viscid fluid exudes, and hardens into an amber-coloured gum, forming stalagmitic masses. This will not burn in the fire, is not soluble in spirit, and only partially so in water. The wood makes good planking, and small spars without knots may be made out of the lower part of the trunk: the upper is too full of knots to be useful where toughness is re-

* *Dombeya columnaris*, Forst. Prodr.—*Araucaria Cookii*, Br. Ms., *A. columnaris*, Hook. Bot. Mag. t. 4635.

quired. The French so-called "Missionaries," who have a saw-mill here, occupy a great part of their time in preparing plank of this tree for exportation. Although the profusion of seedlings on Observation Island would lead one to suppose that cones are abundantly produced, yet one of the only two Pines upon the island bearing fruit when cut down, afforded no more than three small cones, although there were male catkins in abundance. It is monœcious, as *E. excelsa* also certainly is, although I recollect having seen the latter described as diœcious. I forgot to mention in its proper place, that in the very young *E. Cookii*, the four linear cotyledonous leaves are arranged in pairs, while in *E. excelsa* they are equidistant. A *Pandanus*, like *P. pedunculata*, is common; and mats, bags, and baskets of various kinds, are made from the young leaves. The Cocoanut-tree, with its multifarious uses, is the solitary representative of the Palms; and a very fine, wide-spreading, small-leaved *Ficus* is, next to the Pine, the most striking and ornamental tree upon the island. The entrance to "King Jemmie's" palace is through one of these trees, a natural hole in the arched roots of which, having been artificially widened, now presents the appearance of a Gothic arch. Of *Orchideæ* I observed five species: one, a *Dendrobium*, is found on rocks and dead branches of trees; and two of the others are tall, handsome white- and purple-flowered plants, growing among the Fern. Of plants which have probably been introduced, in addition to those which are regularly cultivated, I may mention the Bread-fruit tree, the Papaw, Indian corn, and the Castor-oil plant; but the fruit of the first two does not seem to be held in much esteem. As *Cynthia Cardui* is among insects, from my finding it almost everywhere, in whatever part of the earth I put my foot, so among plants is *Sonchus oleraceus*, which is a weed all over the Isle of Pines, and is commonly eaten by the natives, stem and leaves, uncooked. The only other botanical fact which I shall allude to here is the occurrence of two Proteaceous shrubs* near the summit of the Peak (885 feet). One of these appears to be certainly, and the other possibly, a *Grevillea*, an important fact in botanical geography, for this genus is regarded as being ex-

* There are two highly interesting and new Proteaceous plants. One, the *Grevillea*, may be thus defined:—

1. Grevillea *Gillivrayi*, Hook.; frutex humilis, ramis robustis junioribus aureo-sericeis, foliis coriaceis oblongis obtusis vel retusis brevi-mucronatis oblique penninerviis reticulatim venulosis marginibus recurvis inferne in petiolum brevem attenuatis supra glabris subtus sericeis, racemis multifloris oblongis obtusis patentibus brevi-pedunculatis e ramis novellis terminalibus vix foliosis albo-sericeis, pedun-

clusively Australian. Of these two last there are fortunately living plants of Milne's; and, besides other things, some of a fine Pitcher-plant, which is *not N. distillatoria.* We found this last in one very confined locality, a small patch of swampy ground by a stream, crossing the road along which we were proceeding to Kaji, on a visit to the principal chief, or rather king, for he exercises absolute authority not only over the whole of the Isle of Pines, but also over a portion of New Caledonia. But this is not botany; so, by way of making amends, I may mention that Wendagu (the king) told me, while showing some large double canoes, that they were made in New Caledonia, out of a large tree growing there, which he had heard the sandal-wood traders call *Kaurie.* Now of course this was a Dammara, and no doubt a very noble one. I believe one from that island, got by Moore, has been described. You allude in your last letter to specimens of a Dammara, sent by the late Sir J. Everard Home to the British Museum, from the *Isle of Pines.* Now the locality is incorrect: there is no Dammara there. The species in question, if not the Aneiteum one—of which more anon—is doubtless from the Fijis, where I know he got specimens of a similar character.

We sailed from the Isle of Pines on October 22. We were off Matthew Island on November 4, but it was quite impracticable to land,

culis rachibusque crassis, stylis elongatis glabris perianthio triplo longioribus, stigmate conico-apiculato.

Grevillea. *Macgillivray, Herb. Voy. of H.M.S. Herald, n.* 854.

HAB. Near the summit of the Isle of Pines, main peak, October, 1853. *John Macgillivray, Esq., Mr. W. Milne.*

A very beautiful and well-marked species. Leaves larger, but in shape and texture and colour not much unlike those of *Olea Europæa.* Racemes copious, bearing very numerous flowers.

The other is a *Stenocarpus*:—

2. Stenocarpus *Milnei,* Hook.; frutex glaber humilis, ramis gracilibus strictis, foliis linearibus pinnatifidis subbipinnatifidisve inferioribus simplicibus, laciniis oppositis elongatis obtusis apice glanduloso-callosis ecostatis subreticulatim rugulosis marginibus parum reflexis, pedunculis axillaribus foliis brevioribus, umbellis subsexfloris, involucri foliolis parvis subulatis, pedicellis apice incrassatis calyculatis, stigmate laterali orbiculato.

HAB. Near the summit of the main peak of the Isle of Pines; abundant. *Mr. W. Milne* (*Herb. n.* 118); *Macgillivray, Herb. Voy. of H.M.S. Herald, n.* 855.

General habit of some of the slender varieties of *Grevillea linearis*: but there the leaves are all linear acute, strongly costate, and, as well as the racemose flowers, more or less silky. I refer it to *Stenocarpus,* in the absence of fruit, with little hesitation, in consequence of the truly umbellate inflorescence, and the nature of the stigma, and the general resemblance of the flowers to the original *Stenocarpus Forsteri,* Br. It is a graceful, slender-twigged shrub.

and no anchorage could be found. There did not appear to be any vegetation whatever on the island, which is merely a large cinder, having been seen smoking a few years ago; so I shall pass on to Aneiteum, which we reached on November 7, and where we remained for three weeks. It is the most southern island of the New Hebrides, and on the charts is incorrectly called Annatom or Annatam. My collection of Aneiteum plants is very small, consisting only of sixty-nine species, of which forty-one are Ferns. Although we spent three weeks at Aneiteum, I had very little time to devote to collecting of plants. This however is not of much consequence, as Milne was diligently employed during our stay. The great variety, beauty, and often singularity of the Ferns, I find frequently alluded to in my journal. The damp woods of the interior of the island, especially along the course of the mountain-streams, furnished, among others, a remarkable *Litobrochia*, with the habit of *Lygodium*, running over trees; an *Oleandra*, forming great tufts of linear fronds, five feet long; and a tall, handsome *Marattia*, and a fine flabelliform *Schizæa*, are common in the woods. On the low grounds I fell in with a clump of three individuals of a very fine *Alsophila*, the largest of which had a caudex 15 feet in height to the giving off of the first frond, and 30 inches in circumference at 6 feet from the ground, while the beautiful tripinnate fronds, arching gracefully outwards, attain the length of from 10 to 15 feet. In cutting down this, I ascertained from the natives that the central part near the top is eaten: it reminded me of a bad turnip. A handsome Melastomaceous bush is abundantly mixed up with a very showy white-flowered *Vaccinium* (*V. cereum*, Forst.), on the stiff clayey lower hills. A tall reed forms thickets everywhere on the low grounds, and from its stoutness and height (6 to 8 feet), is much used in the construction of very efficient single or double fences, also as supports for the Yam plants. Of the Breadfruit there are said to be about twenty kinds, specially distinguished by name. I could not myself make out more than two or three well-marked varieties. Four Palms occur—*Cocos*, *Caryota*, *Areca*, and *Sagus*: the last three are rare, and are generally seen near houses. But the most remarkable plant of Aneiteum is a *Dammara*, which Moore (who got it there while in the Havannah) tells me is *D. obtusa*. It does not however agree at all in leaf or cone with the description of that species which I lately saw in Paxton; and yet there is only one *Kaurie* on Aneiteum, which is abundant, and has long been used for timber, as

applied to *D. obtusa* in the description. The only way in which I can account for the discrepancy is, that Moore's specimens had been wrongly labelled for locality. Sir E. Home's certainly were, when they were stated to be from the Isle of Pines. The largest Aneiteum *Dammara* which I saw, measured 23½ feet in circumference 5 feet from the ground. Unlike the *D. Australis* of New Zealand, it is not considered suited for large spars, but cuts up into excellent planks. I could not get any ripe cones; and although abundance of full-sized green ones were hung up on board, in hopes of *some* reaching Sydney in a state fit for germination, the experiment proved a failure. So was it also with *Eutassa Cookii*. The only other Aneiteum plant I shall mention here is a *Santalum*, once abundant, but now almost extinct, so much so that I saw only one individual, that which furnished me with specimens. It had probably escaped the axe of the native on account of its small size, being only a sapling as thick as the wrist, and commercially valueless. I regret not having done more for the botany of Aneiteum, but two-thirds of my entire time were taken up with the vocabularies and grammar, combined with ethnology,—the last important to be secured before Christianity will have brought about the great change in morals and customs which it has already partially accomplished, thanks to the two missionaries of Aneiteum. Even in the central pagan district of Itaho, any European with ordinary prudence and courage is now perfectly safe while passing through from one side of the island to the other, and its magnificent valleys and wooded ravines may be explored by any wandering naturalist. Two-thirds of the population of 2500 belong to the Christian party, wear clothing of some description or other, and have ceased to practise war among themselves, infanticide, and the once customary strangling of widows. The nature of my researches led me to have much intercourse with the natives, and I satisfied myself that the stories regarding the missionaries (originating from sandal-wood traders and others) grossly maligned two good men devoted to the service of their Divine Master.

On November 2 we reached the neighbouring island of Futuna, or Erronan, and, there being no anchorage, stood off and on for two days, during which I was as much on shore as possible, but did not collect any plants. The vegetation of Futuna exactly corresponds to that of Aneiteum, *so far as it goes*, but without the extent and diversity of the latter island. This is in a great measure owing to the want of mois-

ture, caused by local influences, unfavourable to the growth of the Ferns and other inhabitants of dense and moist woods, so numerous in Aneiteum. Among the more remarkable plants not before alluded to (Cocoa-nut, Bread-fruit, reed-like Grass, Yam, Taro, Horse-taro, Kava, etc.), I may mention the purple-flowered *Eugenia*, and the *Areca* of Aneiteum, a *Casuarina* frequenting the shores, a small *Pandanus*, with very long stolons, which is gregarious and abundant, and from the leaves of which baskets and mats are made; and lastly, *Guettarda speciosa*, the beautiful white blossoms of which ornamented the rugged and parched coral-rocks at the N.W. point. Futuna, I may mention, is only about seven miles in circumference, with a steep rocky shore, fringed with coral. It is well wooded, except where the declivity is too great; and the summit (2000 feet) is a dead level, three-quarters of a mile in diameter, and apparently inaccessible. Thanks to the influence of the two native teachers from Aneiteum, the Futunese are now so much less dangerous to visitors than formerly, that I landed alone and unarmed in a canoe (our own boat being unable to face the surf), and traversed the whole island, mixing freely with the people, inspecting their huts and gardens, etc., and was treated with civility throughout.

On the night of passing Tana (Tanna), the volcano made a fine display. By the bye, we had experienced a severe shock of an earthquake at Aneiteum, one day soon after our arrival. On December 7, while hove-to off the island of Mare, two boats were sent on shore, but I had not the opportunity of landing. One of the principal features of this island consists in the abundance of Pines, which were easily recognized, and afterwards identified (from cones brought off) as *Eutassa Cookii*.

On December 10 we reached the Isle of Pines, on our return to Sydney, and remained ten days there, or until the completion of the survey. Fortunately, this time I was enabled to obtain good flowering specimens of the *Santalum* formerly alluded to.

We anchored off Lord Howe Island on the 26th, after having spent a very merry Christmas on very small means. We had no roast beef, but managed to concoct a plum-pudding, and, like Mark Tapley, made ourselves "jolly under the circumstances." During the few hours spent on shore there, the most notable botanical fact was the discovery, on the site of our tent, of a clump of fine turnips, derived no doubt

from some seeds which Milne had accidentally scattered there while serving them out to the settlers three months before.

On January 1st we reached Sydney, where we have been ever since. I have not, nor has any one present, the slightest idea when we sail, or where we at go.

[Among the more remarkable and interesting of the plants that have been already received from the islands thus visited, are a new genus of shrub, apparently of the Order *Dilleniaceæ* (Isle of Pines, n. 849, *Mr. Macgillivray*,—n. 141, *Mr. Milne*); and, from Aneiteum, the curious *Geissois racemosa* of Labillardière, Sertum Austro-Caledonicum, p. 50. t. 50; of which the *G. ternata* of A. Gray, in the Botany of the United States Exploring Expedition, from the Fejee Islands, is probably only a variety.]

On the North Brazilian EUPHORBIACEÆ *in the collections of* Mr. Spruce; *by* GEORGE BENTHAM, ESQ.

(*Continued from p.* 333.)

MABEA.

Our herbaria now contain nine or perhaps ten species of this genus, of which three only are published. All yield a copious milky juice, which, however, we do not hear of being applied to any specific purpose. The bark of one of them is, according to Martius, considered in the Diamond district as a febrifuge; and the young shoots of several species, under the name of *Tacuari*, are used for tobacco-pipes in Guiana and Brazil. Partly on this account, partly from the general resemblance in habit of the species to each other, there is some confusion in the application of the names of the older ones. Aublet's may indeed now be identified from his descriptions, but Martius' *M. fistulifera* is only known by so short a diagnosis, that I cannot even now feel any certainty as to the correctness of my determination, although I am convinced I was wrong as to the species I gave that name to in my first distribution of Spruce's plants.

The several species may from their inflorescence be divided into groups as follows:—

Ser. I. RACEMOSÆ.—*Racemi* solitarii, terminales, thyrsoidei. *Bracteæ* marium glandulis 2 magnis siccitate nigris nitidis stipatæ.

Flores intra bracteas plures pedicellati, umbellati, v. racemulosi.

§ 1. *Pedicellis masculis ternis umbellatis, umbellis pedicellatis.*

1. M. *Taquari*, Aubl. Pl. Gui. p. 870. t. 334. f. 2; ramulis ferrugineo-tomentosis, foliis ovali-oblongis breviter acuminatis basi rotundato-subcordatis subtus tomentellis, umbellis masculis trifloris pedicellatis.

The only certain specimens I have seen are from Leprieur's French Guiana collection. Those gathered by Spruce in the forest of Barra, distributed doubtfully under the same name, belong probably to a different species, but, being in fruit only, I cannot at present determine them.

2. M. *Piriri*, Aubl. l. c. p. 867. t. 334. f. 1; foliis oblongis longe acuminatis basi acutis subtus incanis v. utrinque ramulisque glabris, umbellis masculis trifloris pedicellatis.

From Surinam, *Hostmann*, n. 409 and 1320. A single specimen in fruit, gathered by Mr. Spruce on the Rio Negro, appears to belong also to this species. The leaves are more evidently serrulate, but that is a variable character in all the *Mabeæ*.

A specimen of Goudot's in the Hookerian Herbarium, from the Magdalena river, in New Granada, appears to belong to a distinct species, connecting in some measure the *M. Piriri* with the *M. occidentalis* in inflorescence, as the umbels are but very shortly pedicellate, but differing from both in the female flowers and some other points. The specimen, however, is insufficient for a satisfactory description.

§ 2. *Pedicellis masculis ternis umbellatis, umbellis sessilibus.*

3. M. *occidentalis;* foliis oblongis glabris v. vix ad costam ramulisque puberulis, umbellis masculis trifloris sessilibus. Var. *α*; foliis subtus incanis.—*M. Piriri*, Benth. Bot. Sulph. p. 165. Kl. in Seem. Bot. Herald, p. 102, non Aubl.—Var. *β*; foliis concoloribus glabris.

This has much the foliage of *M. Piriri*, for which Dr. Klotzsch as well as myself had mistaken it, but the male umbels are constantly closely sessile, not borne (with its bract) on a pedicel from one to two lines long. The leaves appear also to be of a somewhat firmer texture. The var. *α* was gathered in the Isthmus of Panama by Cuming (n. 1102), Barclay and Seemann; at the hacienda del Azufre, probably in the same district, by Linden (Herb. du Sud, n. 886), and at Rosarios on

the Rio Hache, near Santa Martha, by Purdie; the var. *β*, in British Guiana, by the Schomburgks (Rob. Schomb. 2nd coll. n. 731, Rich. Schomb. n. 1109); and in the province of Bahia, Brazil, by Blanchet (n. 2326).

4. M. *Schomburgkii;* ramulis ferrugineo-tomentosis, foliis oblongis basi rotundato-subcordatis subtus puberulis, umbellis masculis trifloris sessilibus, coccis dorso bimuricatis.—*M. Taquari*, Kl. in Hook. Lond. Journ. Bot. vol. ii. p. 47, ex parte, non Aubl.

This species differs from *M. Taquari*, as the *M. occidentalis* from *M. Periri*, by the closely sessile male umbels. It has moreover two short blunt points projecting from the back of each valve of the capsule about half-way up, which are not represented in the figures of the fruit of *M. Taquari*. It was found in British Guiana by the Schomburgks (Rob. Schomburgk, 1st coll. n. 40, 2nd coll. n. 358, Rich. Schomburgk, n. 535).

§ 3. ***Floribus masculis racemulosis, racemulis bractea fultis sessilibus.***

5. M. *angustifolia*, Spruce, Pl. exs.; foliis lanceolatis (parvis) subtus ad costam ramulisque ferrugineo-tomentosis, floribus masculis brevissime pedicellatis racemulosis, racemis sessilibus.—*Arbor* gracilis, 15-pedalis, ramis divaricatis pendulisve, ramulis tomento ferrugineo plus minus vestitis. *Stipulæ* lineares. *Folia* 1–1½ poll. longa, 2–3 lin. lata, acuta et setaceo-acuminata, minute serrulata, basi acutiuscula, supra glabra v. vix ad costam puberula, subtus pallida, costa ferrugineo-tomentosa. *Inflorescentia* terminalis, 3–5-pollicaris, ferrugineo-tomentella, floribunda. *Fl. fœm.*, inferiores 3–5 longiuscule pedicellati, ad axillam bracteæ linearis v. lanceolatæ bistipulatæ solitarii. *Sepala* acuminata, ovario longiora. *Racemuli* masculi numerosi, approximati, horizontaliter patentes, plerique 8–9 lin. longi, supra medium unilateraliter 5-flori, summi breviores 1–3-flori. *Flores* erecti, brevissime pedicellati. *Bracteæ* ad basin racemulorum lineares, acutæ, glandulis ovoideo-globosis glabris sæpe 1½ lin. longis.

Ejusdem var. *β*, *oblonga*, differt foliis 1½ poll. longis, 5–6 lin. latis. —*M. fistulifera*, Benth. Pl. Spr. exs. non Mart.

The narrowest-leaved variety was gathered by Mr. Spruce on the Amazon, near Santarem. The rather broader but still small-leaved form was first sent by him from Caripé, near Pará, and afterwards from Obidos, on the Amazon. As this was stated to be used for to-

bacco-pipes by the Brazilians under the name of *Tacuari*, and was then the only Brazilian species known, I presumed it to be the *M. fistulifera* of Martius, with whose very short diagnosis it agreed pretty fairly. I now find, however, that the following is much more likely to be his plant, as it agrees still better with that diagnosis, and I have seen it moreover in Pohl's collection, made in a great measure in the district whence Martius procured his plant.

6. M. *fistulifera*, Mart. Reise, vol. i. p. 497 ?; foliis oblongis acuminatis subtus medio late ferrugineo-tomentosis, inflorescentia ferrugineo-tomentosa, floribus masculis racemulosis, racemulis sessilibus.—*Arbor* parva, 15-pedalis, coma divaricata. *Ramuli* novelli, inflorescentiæ et foliorum pagina inferior ad utrumque latus costæ media per spatium utrinque 2–3 lin. latum, dense ferrugineo- v. aureo-tomentosi. *Folia* petiolata, 3–4 poll. longa, 1–1½ poll. lata, abrupte acuminata, basi rotundata v. cuneata, supra glabra, nitida, subtus præter lineam tomentosam glabra incanescentia. *Stipulas* non vidi. *Inflorescentiæ* 4–5-pollicares, racemulis masculis crebris 8–10 lin. longis, 3–4-floris, pedicellis sæpius diametrum floris æquantibus. *Glandulæ* bractearum magnæ, oblongæ. *Flores fœminei* plurimi, longiuscule pedicellati, pedicellis solitariis, bractea oblongo-acuminata eglandulosa caducissima. *Sepala* lineari-lanceolata, acuminata, ovario longiora. *Capsula* tomentosa.

Gathered by Mr. Spruce in the Serras de Santarem, and distributed under the name of *M. ferruginea*. Also in Pohl's collection, either from Goyaz or Minas Geraes.

Ser. II. Paniculatæ.—*Racemi* graciliores, ad apices ramorum plures paniculati. *Bractearum glandulæ* minores, nunc minutæ.

7. M. *subserrulata*, Spruce, MS.; foliis oblongis coriaceis glabris, racemis paniculatis, umbellis masculis subtrifloris pedicellatis.—*Arbor* gracilis, 18-pedalis. Specimina suppetentia tota glabra exceptis paniculis. *Folia* 3–4 poll. longa, 1½–2 poll. lata, apice basique rotundata, acumine brevi obtuso, margine vix minute serrulata, rigidiora quam in cæteris speciebus, venis a costa divergentibus crebris parallelis longe intra marginem anastomosantibus, supra nitentia, subtus opaca, utrinque tactu scabriuscula. *Racemi* 2–3-pollicares, minute tomentelli. *Umbellæ masculæ* more *M. Taquari* pedicellatæ. *Brac-*

tearum glandulæ minores quam in præcedentibus, multo tamen magis conspicuæ quam in sequentibus. *Flores* parvi, pedicellis inæqualibus sed a basi distinctis nec in racemulos connatis. *Flores fœminei* inferiores plurimi, dissiti, longe pedicellati. *Bracteæ* lanceolatæ ternæ (bractea cum stipulis 2 vix minoribus). *Sepala* late ovata, acuta, ovarium æquantia. *Capsula* sublignosa, ovoideo-globosa, axi 8–10 lin. longa, extus ferrugineo-tomentosa.

In the caatingas at Panuré. The specific name was given by Mr. Spruce probably in allusion to the serratures of the leaves being less distinct than in most species. They are, however, in all cases very variable.

8. M. *nitida*, Spruce, Pl. exs.; foliis oblongis acuminatis mucronatis utrinque ramisque glabris, racemis paniculatis tomentosis, umbellis masculis brevissime pedunculatis, florum pedicellis flore brevioribus v. vix longioribus.—*Arbor* gracilis, 20–50-pedalis. *Folia* 3–5-pollicaria, acumine terminali longiusculo apice mucronato, basi rotundata, per anthesin chartacea v. vix coriacea, demum rigidiora, supra nitida, subtus opaca et siccitate rubicunda. *Panicula* ramosissima, racemis numerosis gracilibus interruptis. *Umbellæ masculæ* fere in glomerulos contractæ, nunc fere sessiles nunc pedunculo ½ lin. longo sustensæ, floribus lineam diametro 6–10-andris, pedicello rarius semilineam excedente. *Bractea* parva glandulis vix conspicuis. *Pedicelli* fœminei 1–2 lin. longi. *Styli* profunde fissi.

Gathered by Mr. Spruce in the moist forest at Barra do Rio Negro in fruit in January, 1851, and again in flower in August, 1851, at the mouth of the Rio Negro, where he found two varieties, one with purplish-red and bluish-grey flowers, the other with white flowers and rather shorter leaves.

9. M. *paniculata*, Spruce, Pl. exs.; foliis oblongis supra nitidis subtus incanis ramulisque tomentoso-pubescentibus glabratisve, racemis paniculatis, umbellis masculis sessilibus, florum pedicellis flore parvo duplo triplove longioribus.—*Ramuli* et folia interdum fere glabra, sed sæpius florum pagina inferior uti ramuli et panicula pilis brevibus crispatis sæpe stellatis plus minus vestita. *Folia* subtripollicaria, acuminata, basi rotundata v. cuneata, margine subserrulata supra nitida, subtus albicantia v. siccitate rufescentia. *Paniculæ* divaricato-ramosæ. *Racemi* graciles, 1½–2-pollicares. *Flores masculi* quam in præcedentibus multo minores, oligandri, pedicellis filiformibus 1–2

lin. longis binis ternisve ad axillam bracteæ sessilis, glandulis parvis tomentellis et ideo vix conspicuis. *Flores fœminei* pauci. *Sepala* ovata, obtusa, ovario breviora. *Stylus* profunde divisus.

In the moist campos at Santarem, *R. Spruce*. There are also in the Hookerian Herbarium, from Pohl's collection, two specimens, probably from different localities, as they bear different numbers (1699 and 1773*), which appear to be a mere variety (*Pohliana*) of the same species, with more coriaceous leaves, more densely pubescent underneath, and rather smaller flowers on shorter pedicels.

The fruiting specimens of Mr. Spruce's, from Barra do Rio Negro, n. 1324, distributed under the doubtful name of *M. Taquari*, may prove to be another paniculate species, but without the flowers they cannot be satisfactorily determined.

SIPHONIA.

"This genus seems abundant throughout the Amazon and its tributaries, but not all the species yield caoutchouc (or Xeringue, as it is here called) of good quality, those of the gapó and caatinga producing a brittle gum in small quantity. The wood in all is soft, soon decaying. The seeds are an excellent bait for fish. Macaws eat them greedily, but to man and quadrupeds they are poisonous in a fresh state. The Indians on the Uaupés render them eatable in this way: after being boiled twenty-four hours, the liquor is strained off, and the mass that remains has something the colour and consistence of rice long boiled. Eaten along with fish it is exceedingly savoury."—*R. Spruce, MS.*

Hitherto the specimens of these plants have been rare in our collections; and as the only two writers who have described them at any length, Aublet and Kunth, had only fruiting specimens before them, it is difficult to identify the two published species. Presuming, however, that the one we have from French Guiana is Aublet's, and that Willdenow's *S. Brasiliensis* is the short-leaved Pará one, which yields the best caoutchouc, it seems probable that the one gathered by Humboldt and Bonpland, and described by Kunth, is the more widely-diffused *S. dis-*

* The numbers which the Brazilian plants, chiefly Pohl's, distributed by the Imperial Herbarium of Vienna, in 1837, bear in the herbaria of Kew, and some others, are not those of Dr. Pohl's original tickets in the Vienna herbarium, but were given on the occasion of the distribution, and intended to correspond with a list of the localities where the specimens were collected, which however was never made out.

color. The following characters, in as far as derived from the anthers and stigmate, have been verified in each instance in several, and often in many flowers, but it remains to be seen how far they may prove constant when we have specimens from a greater variety of sources.

§ 1. *Stigmate sessili divaricato-trilobo.*

1. S. *elastica*, Pers.; foliolis breviter petiolulatis glabris discoloribus, panicula ferrugineo-tomentosa, calycibus obtusis, antheris 5 oblongis serie unica verticillatis.—*Hevea Guianensis*, Aubl. Pl. Gui. p. 871. t. 335.

French Guiana, *Leprieur*. The petiolar glands are small. The anthers are much longer than those of the other species, and constantly arranged in a single row, about the middle of the central column.

2. S. *Brasiliensis*, Willd.; foliolis longe petiolulatis glabris vix discoloribus, glandula maxima peltata, panicula tomentella, pedicellis flore brevioribus, calycibus acuminatis, antheris 7–10 serie duplici verticillatis.

In the forest of Pará, a lofty handsome tree, branching from the base, and yielding the caoutchouc the most abundantly exported. (*R. Spruce.*) The leaves are much shorter than those of *S. discolor*, upon partial stalks 7–9 lines long, with a remarkably large gland at their junction, the veins are very conspicuous, and the leaves, though abundantly covered underneath with the same minute dots as the adjoining species, are scarcely whitened by them, at least in the specimens before me.

3. S. *discolor*, Spruce, MS.; foliolis breviter petiolulatis discoloribus subtus pubescentibus, glandulis parvis, panicula tomentosa, pedicellis flore brevioribus, calycibus obtusis, antheris 7–10 duplici serie verticillatis.—*S. Brasiliensis*, H. B. K., Nov. Gen. et Sp. vol. vii. p. 170? vix Willd.—*Micrandra ternata*, R. Br. Pl. Jav. Rar. p. 237.

Common in the gapó of the Rio Negro, and of its tributary the Rio Uaupés, and known by the name of *Seringue de gapó*. The tree scarcely exceeds 25 feet, but the branches spread out horizontally, sometimes to a considerable distance. The milk is sparing, and scarcely elastic when dry. The leaves are like those of *S. elastica*, but always more or less pubescent underneath, generally 4 or 5 inches long; the flowers of a reddish-purple. The anthers are small and ovate, in two distinct verticils, sometimes both complete, with five in each, but one or two are

frequently wanting in the upper one, and occasionally one also of the lower one. Some specimens in fruit of Mr. Spruce's first Barra collection were distributed as belonging doubtfully to the *S. elastica*. I have referred here Mr. Brown's species, on account of the pubescence of the underside of the leaf.

4. S. *Spruceana*, Benth. Pl. Spr. exs.; foliis breviter petiolatis discoloribus glabris, glandulis parvis, paniculis amplis puberulis, pedicellis flore longioribus, calycibus acuminatis, antheris 7–10 serie duplici verticillatis.

On the shores of the Amazon, below Santarem; a smaller tree than the *S. Brasiliensis*, the leaflets 6–8 inches, or even longer, the panicles a foot or a foot and a half long, with numerous flowers, purple withinside, and much larger than in *S. discolor*, the calyx being 2½ lines long, on pedicels 3 or 4 lines long.

5. *S. pauciflora*, Spruce, MS.; foliolis breviter petiolulatis discoloribus glabris, glandulis parvis, paniculis laxis angustis tomentellis, pedicellis flore subbrevioribus, calycibus obtusis, antheris 7–10 serie duplici verticillatis.

This is certainly near to *S. discolor*, and may prove a mere variety, yet it is a large tree of 40 to 50 feet, yielding a very copious milky juice, and entirely without hairs, although covered on the underside of the leaves with minute white dots, which are soft to the touch, and the flowers are of a pale yellow. It was gathered by Mr. Spruce in rocky situations along the Rio Uaupés, and apparently the same species is found also in British Guiana (Parker, and also Hancock in herb. Hook. —Rob. Schomburgk, 2nd coll. n. 817, Rich. Schomb. n. 1381).

§ 2. *Ovario apice in stylum brevem attenuato.*

6. S. *lutea*, Spruce, MS.; foliolis oblongis membranaceis v. vix coriaceis glabris, paniculis tenuiter tomentosis, calycibus setaceo-acuminatis, antheris 5–8 ad basin columnæ irregulariter subverticillatis.—*Ramuli* glabri. *Petioli* longi. *Foliola* breviter petiolulata, 5–6 poll. longa, circa 2 poll. lata, sæpe subcuneata, breviter acuminata, subtus vix discolora, punctis minutissimis. *Paniculæ* thyrsoideæ, laxifloræ, floribus luteis. *Pedicelli* 1½ lin. longi. *Flores* masculi 1½ lin. fœminei 3 lin. longi, laciniis anguste fere setaceo-acuminatis. *Columna* supra antheras longe producta. *Ovarium* tomentosum, stylo brevissimo sed distincto, stigmate capitato-subtrilobo.

From the forest at the mouth of the Rio Uaupés; a tree of 70 feet, the milk copious, speedily turning black, and staining linen permanently; when dry elastic and very tenacious. Flowers yellow, sweet-scented.

7. S. *rigidifolia*, Spruce, MS.; foliolis ellipticis crasso-coriaceis glabris, paniculis pulveraceo-tomentosis, calycibus subacuminatis, antheris 5–8 ad basin columnæ irregulariter subverticillatis.—*Ramuli* glabrati. *Foliola* breviter petiolulata, 5 poll. longa, $2\frac{1}{2}$ poll. lata, acute acuminata, margine recurva, basi cuneata, multo crassiora et rigidiora quam in cæteris speciebus, subtus punctis crebris albicantia. *Paniculæ* pyramidatæ, semipedales. *Flores* pallide flavi, masculi 2 lin., fœminei 3 lin. longi. *Antheræ S. luteæ. Stylus* evidentior.

A milky tree of 30 feet in height, from the caatingas of the Rio Uaupés, *R. Spruce.*

MICRANDRA, gen. nov. *Crotonearum.*

Mr. Brown having, as he informs me, ascertained that his *Micrandra* is a species of *Siphonia*, that name is now at liberty, and I have applied it to a new genus closely allied to *Siphonia*, and known on the Rio Uaupés by the same name of *Seringue* or *Xeringue*, but differing essentially in its five free stamens and simple leaves. The capsule also is very different from that of the only three species of *Siphonia* in which it is known. The two species described below are very near to each other, and may, when better known, prove to be mere varieties of one.

Char. Gen. MICRANDRA. *Flores* monoici, apetali, paniculati, pedicellati, masculi plurimi, fœminei perpauci alares, bracteis minutis. *Fl. masc. Calyx* profunde 5-fidus, laciniis valvatis. *Stamina* 5, sub disco depresso 5-crenato inserta, libera. *Fl. fœm. Calyx* marium laciniis caducissimis. *Ovarium* disco tenui impositum, ovoideo-conicum, triloculare, ovulis solitariis. *Stylus* brevissimus, lobis 3 brevissimis latis retusis.—*Arbores* Brasilienses, foliis alternis petiolatis simplicibus, paniculis axillaribus, floribus luteis.

1. M. *siphonioides;* foliis amplis elliptico-oblongis, paniculis multifloris petiolo longioribus.—*Arbor* 50–60-pedalis, truncis fasciculatis usque ad 10 in eadem stirpe, ramis succo lacteo abunde scatentibus, tota glabra exceptis ramulis novellis et inflorescentiis pulveraceo-puberulis. *Folia* longe petiolata; lamina 8–11 poll. longa, 4–5 poll. lata, breviter acuminata, basi obtusa, membranacea, penninervis et transver-

sim reticulato-venulosa, glandulis in pagina inferiore ad axillas venarum inferiorum paucis haud prominulis et sæpe omnino deficientibus. *Paniculæ* rhachis sub ramulis compressus, ramuli racemosim dispositi, dichotome cymiferi. *Pedicelli* breves. *Calyces* masculi aperti 3 lin. diametro, laciniis ovatis. *Discus* pubescens. *Filamenta* calycem subæquantia, antheris parvis ovatis bilocularibus. *Flores fœminei* perpauci. *Ovarium* pubescens.

From the gapó of the Rio Uaupés, growing with the following.

2. M. *minor;* foliis anguste v. obovali-oblongis, paniculis paucifloris petiolo brevioribus.—*Arbor* 40-pedalis, præcedenti certe affinis, sed teste Spruceo distincta est. *Specimina* differunt foliis raro 4-pollicaribus, inflorescentiis brevibus parum ramosis et ut videtur flores masculi et fœminei in ramis (an in stirpibus?) diversis. *Fructus* adsunt nonnulli vetusti globosi, magnitudine cerasi, coccis minus facile secedentibus quam in plerisque Euphorbiaceis.

POGONOPHORA, gen. nov. *Crotonearum.*

Male specimens of the plant distributed under this name had been long known to me from Schomburgk's collections, and I had frequently examined them, but in the absence of the female I was quite at a loss as to what family to refer them. When I again received the plant among Spruce's, although I still only found males, it became necessary to determine them in some way, and my friend Mr. Miers kindly analysed them for me with his usual accuracy, and drew up a generic diagnosis, so far as the male plant could supply it, believing it to be closely allied to *Ætoxicum*, *Villaresia*, and *Bursinopetalum*, among *Aquifoliaceæ.* Mr. Spruce has now however sent female specimens of a slight variety of the same plant, which at once show it to be a true *Euphorbiacea*, and have enabled me to find females of the original variety among the unarranged *Euphorbiaceæ* of the Hookerian herbarium. I am thus enabled to complete the character, which will place it in the Tribe of *Crotoneæ*, although it does not bear any immediate relation to any genus hitherto published. The rudiment of an ovary in the males (a somewhat further development of the central column of *Siphonia*) and something of the general habit, show an approach to *Buxeæ*, but the ovules are constantly solitary in each cell.

Char. Gen. POGONOPHORA, *Miers, MS.*—*Flores* dioici, sessiles, in spicas simplices v. paniculato-ramosas dispositi. *Sepala* 5, æstivatione

valde imbricata. *Petala* 5, calyce longiora, æstivatione imbricata, intus medio barbata. *Fl. masc. Stamina* 5, petalis alterna, sub disco depresso cupulato crasso 5-lobo inserta. *Antheræ* lineares, biloculares. *Ovarii* rudimentum in medio disco lineare, apice 2–3-fidum. *Fl. fœm. Ovarium* disco brevi membranaceo cupulato obsolete 5-lobo cinctum, in stylos 3 apice breviter bidentatos desinens, intus triloculare. *Ovula* in loculis solitaria, a placenta fungoso-cupulata pendula. *Capsula* coriacea, acuta, 3-cocca, coccis demum semibifidis intus dehiscentibus. *Albumen* carnosum, cotyledones foliaceæ, radicula brevis.

Species unica, *P. Schomburgkiana*, Miers, MS.—*Frutex* v. arbor debilis 10–20-pedalis, glaber, exceptis inflorescentiis partibusque novellis pube minuta subglandulosa canescentibus. *Stipulæ* minutæ, caducissimæ, rarius etiam in ramulis novellis conspicuæ. *Folia* alterna, petiolata, ovata v. oblonga, 3–5 poll. longa, $1\frac{1}{2}$–2 poll. lata, obtusa v. breviter acuminata, integerrima, basi acuta, chartacea v. subcoriacea, utrinque glabra, supra nitidula penninervia, petiolo semipollicari v. longiore apice incrassato. *Spicæ* interruptæ v. sæpius paniculæ axillares 1–3-pollicares, masculæ fœmineis longiores et ramosiores. *Flores* albidi, suaveolentes, vix sesquilineam longi, ad axillam bractea brevis concavæ squamæformis arcte sessiles, et bracteolis 2 parvis fulti. *Sepala* orbiculata, crassiuscula, glabra v. pube minutissima canescentia, exteriora minora, sub fructu persistentia. *Petala* duplo longiora pariter rigidula et sæpius glabra, marium intus densius et longius barbata quam fœmineorum. *Stamina* calycem æquantia, filamentis apice barbatis, antheris filamento æquilongis. *Capsula* 4 lin. longa, extus tomento minuto canescens. *Semina* ovoidea, compressiuscula, nitida, siccitate venis tenuibus reticulata.—Var. *longifolia* non differt nisi foliis 5–7 poll. longis, evidentius acuminatis, inflorescentia simpliciore, floribus paullo minoribus.

In the thick bush on the Rio Negro, *Rob. Schomburgk*, 1st coll. n. 859; in the capoeiras near Barra, and in the gapó at San Gabriel do Cachoeiras on the same river, *R. Spruce;* in the province of Pernambuco, *Gardner* (a single specimen); and in Brazil without the precise station, *Swainson*, in the Hookerian Herbarium. The long-leaved variety was found by Spruce in the rocky gapó near Airão on the Rio Negro.

Jatropha.

There are only two species of this genus in the collection, both well known, and widely diffused, viz., the *J. gossypifolia*, Linn., from waste grounds, near Pará, distributed as *J. mollissima*, Mart. (which is probably a mere variety), and *J. multifida*, Linn., from the Igarapé de Mahicá, near Santarem.

The *Curcas purgans*, Medik., was also gathered near Santarem, where it is called *Piùm* by the Brazilians.

Croton.

From this vast genus numerous species have of late been detached by Dr. Klotzsch, in various separate papers on *Euphorbiaceæ* of different countries, without any indication of the limits to which he would confine *Croton* itself; until, therefore, he has given a comprehensive sketch of the whole series, it is difficult to decide on the value of the genera he proposes. The petals of the female flowers are always rudimentary or very small, and their presence or absence would appear to be of little importance; and even the æstivation of the lobes of the calyx, and the degree with which they are united, does not seem to be of so much value in this as in other cases. Without denying that many of his divisions may prove useful for adoption, as sections, or even in some cases as really good genera, I shall, however, for the present, in the following enumeration, include them all under the original name of *Croton*, reserving for a future occasion a general review of the genus, should it not in the meantime be made by some other hand.

1. C. *palamostigma*, Kl. in Lond. Journ. Bot. vol. ii. p. 48.

From the capoeiras near Barra do Rio Negro. A smaller variety from the same place was distributed as *Croton*, n. 3. If this and the three following species are true *Crotons*, surely the *Cyclostigma* recently proposed by Klotzsch cannot be a good genus.

2. C. *caryophyllus*, sp. n.; arborescens, foliis magnis ovatis oblongisve basi rotundatis subintegerrimis utrinque scabris subtus pallidis, glandulis baseos 2 scutellatis, spicis longis terminalibus, floribus masculis glomeratis 10–12-andris, fœmineis ad basin spicæ v. in glomerulis masculis inferioribus solitariis, calyce 5-fido valvato patente, petalis minutis v. nullis, styli laciniis ter bifidis radiantibus.—Affinis *C. palamostigmati*, differt tomento fere ad tubercula reducto, foliis angustio-

ribus basi rotundatis nec cordatis, floribus minoribus. *Petala* marium lineari-oblonga, dorso ciliata, calycem æquantia, fœmineorum vix conspicua.

A slender tree of 15 to 20 feet; leaves smelling of cloves when bruised. In the Matinha, near Barra do Rio Negro, distributed as *Croton*, n. 4.

3. C. *Matourense*, Aubl. Pl. Gui. p. 879. t. 338.—*C. sericeus*, Lam. Dict. vol. ii. p. 210.

From Barra do Rio Negro, distributed as *Croton*, n. 2.

4. C. *cuneatus*, Mart. ex Kl. in Lond. Journ. Bot. vol. ii. p. 49.

From the gapó on the Rio Negro, near San Gabriel do Cachoeiras.

5. C. *Spruceanus*, sp. n.; fruticosus, foliis ovatis acuminatis basi rotundatis v. subcordatis membranaceis supra læte virentibus glabris subtus lepidoto-incanis, glandulis baseos 2 parvis scutellatis, racemis unisexualibus?, floribus subsolitariis, calycibus valvatim 5-dentatis, masculis 15–20-andris, fœmineorum stylo semitrifido laciniis subbipartitis, capsula intra calycem coriaceum valde auctum inclusa.—*Frutex* est 15-pedalis, ramis tenuibus, ramulis lepidotis. *Stipulæ* minutæ, caducæ. *Folia* 3–6 poll. longa, $1\frac{1}{2}$–3 poll. lata, petiolo 3–6 lin. longo, penninervia, venis 2 infimis oppositis, additis interdum utrinque 1–2 tenuibus ex eodem puncto, sed minus distincte 5–7-nervia quam in *C. syringæfolio*. *Racemi* quos floridos vidi masculi sunt, 2–3-pollicares, subsecundi, lepidoto-tomentosi. *Pedicelli* floridi 2 lin. longi. *Calyces* subglobosi, 2 lin. diametro, in vivo albi, in sicco rubescenti-lepidoti, breviter 5-dentati. *Petala* cum glandulis disci alternantia, calycem æquantia, oblonga, margine barbata. *Stamina* sæpius 17–18, infra medium barbata. *Racemus fructifer* in altero specimine 4-pollicaris, floribus superioribus (an masculis?) delapsis. *Calyx* fructus junioris ovato-pyramidatis, 3 lin. longus, coriaceus, 5-dentatus; circa capsulam maturam globoso-conicus, 7 lin. diametro, capsulam superans, rufescens, lepidoto-tomentosus. *Stylus* persistens, usque ad medium integer, erectus et tomentosus, ramis glabris.

Among inundated rocks at the falls of San Gabriel. The leaves are aromatic.

6. C. *mollis*, sp. n.; fruticosus, ramulis hirsutis, foliis oblongo-lanceolatis integerrimis utrinque pilis longis hirsutis et subtus molliter incano-tomentosis, glandulis ad apicem petioli 2–4 stipitatis, spicis brevibus tomentosis, floribus breviter pedicellatis subsolitariis ap-

proximatis, calycibus valvatis masculis 10-andris, fœmineorum stylis 3 bipartitis.—*Frutex* gracilis, 9-pedalis. *Folia* 2–2½ poll. longa, vix semipollicem lata, acutiuscula, basi angustata sed obtusa, mollia, supra viridia at dense pilosa, subtus mollissima. *Stipulæ* setaceæ, hirtæ, 1–3 lin. longæ. *Spicæ* 1–2-pollicares. *Bracteæ* masculæ unifloræ vel rarius 2-3-floræ. *Flores* globosi, vix lineam lati, molliter tomentosi, laciniis latis valvatis. *Petala* calycem æquantia, extus villosa. *Filamenta* villosa. *Discus* 5-glandulosus. *Calyx* fœmineus profunde 5-fidus. *Petala* nulla (v. rudimentaria?). *Discus* obsolete glandulosus. *Capsula* villosa, calyce duplo longior.

In the gapó of the Rio Negro, near Barra; aromatic when bruised. It is evidently allied to *C. suavis*, H.B.K., but readily distinguished by the long hairs with which it is clothed, besides the narrower leaves, etc.

7. C. (Cleodora?) *Cajucara*, sp. n.; arborescens, foliis oblongis acuminatis integerrimis basi subemarginatis membranaceis eglandulosis subtus squamellis stellulatis conspersis, spicis terminalibus lepidoto-incanis, floribus masculis glomeratis 15-andris, fœmineis solitariis sessilibus, calyce 5-fido imbricato, styli ramis bifidis.—*Arbor* parva, ramis tenuibus, novellis lepidoto-incanis demum glabratis. *Folia* breviter petiolata, 3–5 poll. longa, raro pollice latiora, utrinque viridia et glabra nisi supra ad costam et subtus parce squamellis conspersa. *Spicæ* tenues. *Flores masculi* globosi, profunde 5-fidi, laciniis latis leviter imbricatis. *Petala* 5, oblonga, calycem æquantia, extus villosa. *Filamenta* villosa. *Discus* eglandulosus. *Calyces fœminei* ovoidei, 2–3 lin. longi, ore clausi, laciniis latis valde imbricatis, interioribus fere petaloideis. *Ovarium* apice contractum in collum calycem æquantem. *Styli* rami breves, extra calycem radiantes.

On the Lago de Quiriquiry, near Obidos. It is called *Cajucara* by the Brazilians. I have not seen Klotzsch's *Cleodora Sellowiana*, but the generic characters appear to be applicable to the present species.

8. C. (Astræa) *lobatus*, Linn., from Obidos.

9. C. (Barhamia) *asperrimus*, sp. n.; fruticosus, foliis breviter petiolatis ovatis v. ovali-oblongis dentatis subtrinerviis utrinque viridibus asperrimis, glandulis baseos 2 scutatis substipitatis, racemis strictis, floribus masculis solitariis 10–12-andris fœmineorum calycibus 5-partitis, styli ramis 4-partitis.—*Frutex* ramis virgatis pilis strigosis

et stellatis asperatis. *Folia* 2–3 poll. longa, 1–1½ poll. lata, acuta v. obtusiuscula, basi rotundata, petiolo 2–4 lin. longo. *Spicæ* terminales, strictæ sed tenues, 4–6-pollicares. *Bracteæ* lanceolatæ, glandulis 2 iis foliorum similibus stipatæ. *Flores masculi* globosi, breviter pedicellati, laciniis æstivatione leviter imbricatis. *Petala* calycem æquantia, villosa. *Receptaculum* villosum. *Calycis* fœminei laciniæ oblongæ subdentatæ, capsulam hispidam subsuperantes.

From the neighbourhood of Obidos, on the Rio Negro.

10. C. (Brachystachys) *hirtus*, Lhér.—A weed in the roças near Santarem.

Report of a JOURNEY OF DISCOVERY *into the Interior of* WESTERN AUSTRALIA, *between* 8*th September*, 1848, *and* 3*rd February*, 1849; *by* J. S. ROE, ESQ., Surveyor-General.

(*Continued from p.* 345.)

January 1st, 1849.—Proceeding after breakfast to the examination of this inlet upwards, in a westerly direction, we soon found the face of the country so rugged, and broken into precipitous rocky gullies and ravines, that to make any progress near its shore was a task of no easy accomplishment. Matters grew even worse as we proceeded; and at length, finding that only detriment and loss of time ensued, and that our weary horses (who had lost twenty-five shoes amongst them) could scarcely be got along at all over the stony surface, I encamped about five miles from the mouth of the inlet, and next day proceeded S.W. towards more accessible country behind Cape Knob. In that neighbourhood Bob, who might now be considered to have got again within the limits of his own immediate country, informed me some wild cattle had long been roaming at large, and I felt desirous of ascertaining what had attracted them to the spot. In seven or eight miles we were upon their tracks, amongst numerous small rocky lagoons and swamps, in the midst of which were three small open lakes of good permanent water, which seemed to have been their particular and favourite resort. The tracks were very old, none of them having to all appearance been made within the preceding twelve months. It is therefore needless to say we saw none of the animals, the total number of whom we now learnt did not exceed three. The lakes and lagoons here alluded to

form part of an extensive chain, which occupy the lowest level in a wide valley, formed by the northern slope of the sea-coast hills. These hills are of a limestone and sandy formation, and probably hold up much of the drainage on its way to the sea, as fresh water is always to be found among the sand-hills of the sea-coast abreast, by scraping a small hole in the sand.

Before proceeding further westward, I made one more visit to the neighbouring sea-coast, for the purpose of examining its formation, being greatly prompted to this step by the alarming illness of one of our best pack-horses (Smiler), who lay stretched out on his side beyond our power of relief, for in the first place we could not decide with certainty what was the matter with him, and in the second, we had no horse medicines with us. Leaving him under the safest treatment we could devise, we proceeded, mounted, to the beach, as far eastward as the "Smooth Rocks," lying westward of Cape Knob. Here a steep granite head projected southward towards the Rocks, and from its summit I observed a small dry rock, not laid down in any existing chart, about half-way between Smooth Rocks and the nearest trend of Cape Knob, or about two miles and a half from each. The sea appeared perfectly clear and deep all round it, and from its lying low, and being apparently not larger than a large boat, would be dangerous to a vessel making free with the shore in the night. At this rocky head I had again an opportunity of observing the remarkable geological formation which had been so conspicuous in the northern part of Bremer Bay, and noticed that, while the head itself was composed of hard compact granite, it was overlaid on the western side by brown calcareous sandstone, adhering to it with the tenacity of a strong cement, and mixed with many petrified roots. Horizontal cliffs of the same kind of sandstone extended behind the beach westward.

Returning westward along the beach, it was found to be fronted by a ledge of flat rocks, even with the water's edge, against which the sea broke heavily during a fresh S.E. wind, and created occasionally a smooth shelter within for boats. In this limited space of 20 to 60 yards wide, and 6 to 10 feet deep, shoals of fine salmon were swimming about, but would take no bait.

A little further westward the route lay across one of those extensive sheets of bare sand prevalent on all sea-coasts, where the low white sand is kept so continually in motion by peculiar eddies of the prevail-

ing winds, that vegetation fails in its struggles to maintain even a scanty existence upon them. Here the process was going forward in full force, and the sand-hillocks undergoing a rapid change of position by the force of a strong S.E. wind. The entire "sand-patch" was in motion, and enveloped in a thick cloud of sand, moving along with as much facility as smoke, and gaining only fresh impetus by the perpendicular resistance it frequently encountered. To move at all amongst these animated sand-heaps with our loaded horses, seemed at first a proceeding of rather doubtful issue, on account of fancied quicksands; but on Bob's assurance it was a safe road, always used by the black fellows to avoid the adjoining rocky, scrubby country, we advanced into it, and found the footing tolerably firm throughout its whole extent of three or four miles. In that space our route sometimes lay over broad sheets of white limestone-rock, of that peculiar oolitic formation which embraces the appearance of large roots of trees, and amongst these rocks would occasionally appear one solitary plant, or bush, struggling for existence against the overwhelming sands. Thus had evidently all the adjoining land been formed, and the process seemed in rapid continuation.

While traversing that part of this dreary waste which borders on the sea-coast, we came suddenly upon the skeleton of a human being, reposing upon a broad limestone sheet, about 200 yards behind the beach. Our native immediately explained they were the remains of one of three seamen who had quitted a Hobart Town whaler, some eighteen months ago, in the vicinity of Middle Island, for the purpose of walking into Albany,—a distance which they could scarcely have rightly understood was fully 350 miles at the shortest. Why these men quitted, or were suffered to quit, their ship thus, on so inhospitable a coast, it is unnecessary here to remark on. The only survivor of the three, who was recently in the employ of Mr. Cheyne, at Cape Riche, declared they were landed with their own consent, supplied by the captain with as much provisions as they chose to carry, as also a musket and ammunition amongst them; that, after a long ramble, they became much distressed for fresh water, and at length separated to search for it more inland, agreeing to rendezvous at a certain hill, then in sight in advance, but that they never did so rejoin or see each other, and that he alone survived the fearful journey. The natives seemed to have been fully aware of the death of the other two, and ascribe it to

actual starvation and exhaustion, disclaiming most strongly having used any personal violence, but, on the contrary, having endeavoured to assist the only one of them they saw before his death, who had however, through fear or distrust, invariably pointed his gun when any of the natives offered to approach him. The unfortunate man now before us was said to be one of them, the other lying somewhere amongst the sand-hills to the eastward, in a spot which our native did not profess to know. He was of rather short stature, had on the remains of a coarse white shirt, blue serge shirt, and moleskin trowsers; one blucher boot, with a foot in it, was detached a few yards, and the other lay near it, showing, with other evidences of severed limbs, that the body had been, after death, attacked by wild dogs. Two of these animals, of large size, were seen near the spot, feeding on a piece of whale-flesh, and Mr. Gregory got a long rifle-shot at them, but they succeeded in getting clear off. Any attempt to describe the features or person of the unfortunate man before us would be perfectly useless, the face and hair having been totally destroyed, leaving the scalp still on the skull, and some parchment-looking skin stretched over the skeleton of the body. After ascertaining that no marks of personal violence appeared on those parts of the head and body capable of showing any, the remains were collected and removed to a neighbouring hollow, where we built over them a pile of limestone-rocks, six feet long and three feet in height, with a large slab at the head, and left the poor fellow to repose near the spot where he had so miserably terminated his fatal journey. The heap would doubtless soon have been covered by a hillock of sand, and would become a collection of petrified bones. The position is about three miles N.N.W. ½ W. from the Smooth Rocks westward of Cape Knob.

(To be continued.)

On Maddenia *and* Diplarche, *new Genera of Himalayan Plants; by* J. D. Hooker, M.D., F.R.S., *and* T. Thomson, M.D., F.L.S. With two Plates, XI. and XII.

The following are two of the most remarkable new genera that have hitherto presented themselves to us during the examination of our Indian Herbarium. Their very remarkable structure has induced us to take the earliest opportunity of making them known, believing, as we

Diplarche multiflora H.f & T.

Diplarche pauciflora H.f & T.

J.D. Hanal Fitch lith. Vincent Brooks imp.

J. D. H. and. Fitch lith. Vincent Brooks imp.

Maddenia himalaica Hf. & T.

do, that they are peculiarly interesting both in a structural and systematic point of view. The genus *Maddenia*, in particular, is quite exceptional in its Order, from presenting apparently normally dimorphous flowers, a feature that has not hitherto been recorded amongst *Rosaceæ*.

Diplarche, which is an undoubted Ericeous plant, and in many respects more closely allied to *Loiseleuria procumbens* than to any plant of the Order, differs from the majority of the family in the dehiscence of the anthers, and from all in the two series of stamens, of which the outer or upper series is epipetalous, and the lower sometimes epipetalous, but more frequently hypogynous.

In the name *Maddenia* we are desirous of commemorating the botanical services of Major E. Madden, of the Bengal Artillery, a well-known and most valuable contributor to our knowledge of Himalayan plants.

Nat. Ord. ROSACEÆ. Tribe AMYGDALEÆ.

I. MADDENIA, Hook. fil. et Thoms.

Calyx late campanulatus, 10-fidus; lobis brevibus inæqualibus coriaceis, nonnullis interdum in petala linearia inæqualia elongatis. *Stamina* 20–30, subbiseriata, disco tenui calycis tubum vestienti inserta. *Ovaria* 1–2, ovulis 2 suspensis; ovario in floribus 1-pistillatis elongato ovoideo fertili, stylo elongato, stigmate oblique truncato; in floribus 2-pistillatis utrumque ovarium imperfectum, ovoideum, ovulis abortivis, stylo nullo, stigmate sessili oblique truncato. *Drupa* carnosa, ovoidea, putamine tenuiter crustaceo subcompresso, hinc tricarinato. *Semen* pendulum, testa membranacea, cotyledonibus crassis. —Arbor *Himalaica, 20–30-pedalis, ramosa.* Rami *cortice fusco-castaneo nitido tecti;* ramuli racemi *et* folia *subtus dense lanato-villosa.* Folia *decidua, petiolata, basi ovata v. cordata, oblonga, ovato-lanceolata vel ovato-oblonga vel interdum lanceolata longe acuminata superne impresse-venosa, marginibus ciliato-denticulatis, dentibus inferioribus præcipue glanduloso-capitatis;* stipulis *magnis lineari-lánceolatis submembranaceis acuminatis basi glanduloso-dentatis.* Racemi *breves, densiflori, ramulos breves terminantes.* Flores 8–20, *breve pedicellati, albidi.* Petala *cum* calycis lobis *plerumque confusa, interdum distincta.* Stamina *longe exserta.* Stylus *ultra stamina breviter exserta.* Drupa *carnosa, purpurea.*

1. Maddenia *Himalaica*, H.f. et T. (TAB. XII.)

HAB. In Himalayæ Sikkimensis temperatæ vallibus interioribus, alt. 8000–10,000 ped. Fl. Mai.; fr. Aug.—*J. D. H.*

A very remarkable plant, resembling a *Pygeum* in the flowers, when these are in an ordinary condition, but differing remarkably in the foliage and drupe, which are altogether that of *Cerasus*, and in the frequent presence of two abortive ovaries, which enlarge to half the size of the ripe fertile drupe, have little pulp, and perfect ovules, which appear never to be impregnated, owing to the imperfect stigma.

Plate XII. Fig. 1, flower; 2, the same laid open; 3, petal; 4, ovary cut open; 5 and 6, ovules; 5 *bis*, ripe fruit; 6 *bis*, vertical section of the same; 7 and 8, front and lateral view of putamen; 9, seed; 10, embryo; 11, inner face of cotyledon and plumule; 12, imperfect ovaria; 13, vertical section of one of the same; 14, ripe fruit:—*all but* 5–8, *and* 14, *highly magnified.*

Nat. Ord. Ericeæ. Tribe Rhodoreæ.

II. Diplarche, Hook. fil. et Thoms.

Calyx 3-bracteatus, campanulatus, 5-sepalus, sepalis inæqualibus. *Corolla* decidua; tubo brevi cylindraceo; lobis 5 patulis; ore vix contracto. *Stamina* 10, inclusa, 5 epipetala altius inserta, lobis alterna, 5 alterna inferius inserta v. omnino hypogyna; antheris didymis longitudinaliter dehiscentibus. *Pollen* globosum, trigonum, angulis incrassatis. *Ovarium* disco obscure 10-lobo brevi insertum, 5-loculare, placentis axillaribus 2-lobis polyspermis; stylo brevi; stigmate capitato, 5-lobo, lobis bilobis. *Capsula* loculicide 5-valvis, valvis a septis papyraceis secernentibus. *Semina* plurima, obovato-cuneata, non alata; *testa* laxa, reticulata; albuminis granulis magnis; *embryone* brevi, cylindraceo; *cotyledonibus* brevibus.—Fruticuli *Himalaici Ericoidei, sempervirentes;* caules *prostrati, ramosi;* ramis *cicatricibus creberrime notatis, ascendentibus, foliosis.* Folia *parva, sessilia, erecto-patentia, subimbricata, lineari-oblonga, coriacea, lucida, marginata, serrata v. longe ciliata, subacuta v. glandula incrassata terminata.* Flores *terminales, in capitulum pauci- v. multiflorum aggregati, parvi, rosei, inodori, 3-bracteati;* bracteæ *ciliatæ, inferior major, late ovata, laterales lineares sepalis minores.* Sepala *coriacea, ciliata.* Corollæ *coriaceæ tubus calyci æquilongus, lobis obovatis obtusis retusisve.*

Genus e tribu *Rhodorearum*, Don, *Loiseleuriæ* antheris rima longitudinali dehiscentibus affine, sed staminibus biseriatis ab omnibus dis-

tinctissimum et ob seriem inferiorem sæpissime perigynam et post lapsum corollæ persistentem admodum singulare.

1. Diplarche *multiflora*, H.f. et T.; ramis glanduloso-pubescentibus, bracteis exterioribus ovato-lanceolatis, floribus plurimis dense capitatis, sepalis lineari-oblongis subacutis, corollæ lobis obovato-oblongis, staminum serie inferiore plerumque epipetala, capsulis spicatis. (TAB. XI. *A.*)

HAB. Sikkim Himalaya, in montibus interioribus vallis Lachen; alt. 11,000 ped. Fl. Jun. 1849.—*J. D. H.*

Spithamæa; *caulibus* robustis, crassitie pennæ corvinæ; *ramis* ascendentibus. *Folia* $\frac{1}{5}$–$\frac{1}{3}$ unc. longa, 1 lin. lata. *Capitula* fere globosa, $\frac{1}{2}$ unc. diametr., 8–20-flora. *Bracteæ* inferiores latiores. *Pedunculus* seu rachis racemi post anthesin elongatus, strictus, validus, pubescens. *Capsulæ* secus rachin sessiles, remotæ, $\frac{1}{8}$ unc. diam. *Semina* plurima, parva, cuneato-obovata.

Plate XI. *A.* Fig. 1, leaf; 2, bracts; 3, flower; 4, sepal; 5, corolla; 6, flower laid open; 7, stamen; 8, pollen; 9, ovary, cut across; 10, capsule; 11, seed:—*all magnified.*

2. Diplarche *pauciflora*, H.f. et T.; ramis glabriusculis, bracteis exterioribus late ovatis, floribus paucis terminalibus, sepalis ovato-oblongis obtusis, corollæ lobis orbicularibus, staminum serie inferiore hypogyna, capsulis ad apicem ramuli terminalibus. (TAB. XI. *B.*)

HAB. Sikkim Himalaya, in regione alpina interiore; alt. 15,000 ped. Aug. 1848.—*J. D. H.*

Omnibus partibus minor præcedente. *Caulis* ramique prostrati. *Folia* $\frac{1}{5}$–$\frac{1}{10}$ unc. longa. *Flores* 2–6 ad apices ramulorum, *corollæ* lobis obtusis v. subretusis. *Stamina* seriei inferioris interdum varie aggregata, plerumque hypogyna, post lapsum corollæ persistentia.

We have named this very remarkable genus *Diplarche*, in allusion to the two series of stamens, which is its most remarkable character. Its nearest affinity is certainly the little *Loiseleuria procumbens* (*Azalea*, Lin.) of the Scotch mountains, which is also a native of the Arctic regions, and of the alps of Northern and Southern Europe, Siberia and North America, but does not inhabit the Himalaya. With this, *Diplarche* agrees in habit, and in the dehiscence of the anthers, but differs in the alternate leaves, and many other important characters of inflorescence and flower. The dehiscence of the capsule is normally septicidal, though not obviously so at first, owing to the dorsal portion of the

valves breaking away from the septa, which remain attached to the axis of the capsule as thin scarious membranes. The ripe capsule appears to have two integuments, the outer coriaceous coat of each valve separating from the inner or more crustaceous one, whose margins alone are inflexed.

It has been remarked long ago, by De Candolle and others, that *Ericeæ* are intermediate between *Calycifloræ* and *Corollifloræ;* and though the present genus certainly tends to favour this view, it does not in our opinion throw any further light upon the position of the great order, or rather alliance, of *Ericeæ.* These great groups of Jussieu are no doubt, to a great extent, artificial, but in the present state of systematic botany they are essential aids to determining the positions of the many Natural Orders they include: for this purpose we believe them to be the most valuable that have been suggested hitherto.

Plate XI. *B.* Fig. 1, leaf; 2, bract; 3, flower; 4, corolla; 5, the same laid open; 6, stamen; 7, pollen; 8, ovary cut across; 9, ripe fruit, with persistent sepals, and lower series of stamens; 10, dehiscing capsule; 11, seed; 12, the same with testa removed; 13, section of albumen and embryo; 14, embryo:—*all magnified.*

Note on the Genera Streptostigma, Regel, *and* Streptostigma, Thwaites; *by* Berthold Seemann, Ph.D.

At page 298 of the present volume, Mr. G. H. Thwaites, of Peradenia, in Ceylon, has given the name of *Streptostigma* to a Sapindaceous genus, being of course unaware that the name had been conferred, about a year before, upon a Solanaceous plant by Mr. A. Regel, of Zurich. In 'Bonplandia,' vol. ii. p. 35, I pointed out the identity of Regel's genus with Bentham's *Thinogeton* (*Dictyocalyx*, Hook. fil.),—the twisted stigma seen by Regel being a monstrosity;—but as the soundness of my view was called into question by the author of the Solanaceous *Streptostigma* (Gartenflora, Jahrg. 1854, p. 106 and 170), I may be allowed to state, that Mr. E. Regel himself has written to me to say that he has abandoned his position, and joined me in the one I have taken up in this question; so that the name of Thwaites' genus requires no alteration,—which it would, if Regel's *Streptostigma* had not proved identical with *Thinogeton.*

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